Mining CONGRESS JOURNAL

AMC

LINK-BELT Heavy-Media Preparation Plant

solves problem of cleaning No. 3 Pocahontas seam

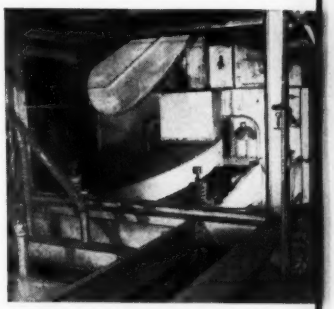
PICTURED here is the Link-Belt Heavy-Media Preparation Plant used by Pocahontas Fuel Company Incorporated to uniformly clean Pocahontas No. 3 Seam coal at their Itmann mine, in Wyoming County, West Va.

The world famous by-product coal of the Pocahontas No. 3 Seam does, in some areas, contain impurities and economical cleaning presents a problem.

With the installation of the Link-Belt Heavy-Media Preparation plant, Pocahontas Fuel Company Incorporated is producing 700 tons per hour of a uniformly high grade coal from this seam at their Itmann mine.

Link-Belt Multi-Louvre Dryers, which efficiently remove moisture, participate in the cleaning operation. Five clean, dry, accurate sizes are individually loaded or blended—and refuse is disposed of by the Link-Belt handling system.

This Link-Belt-engineered preparation plant is another instance of Link-Belt's continuing efforts to aid the mining industry in solving challenging problems. It's also an example of how Link-Belt offers one dependable source . . . one undivided responsibility for a complete modern coal preparation plant.



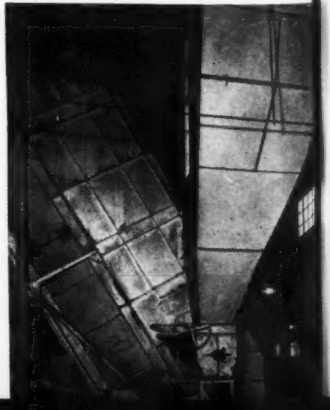
Link-Belt Float-Sink Concentrator permits high or low specific gravity separation. High accuracy is achieved even when amount of impurities in feed fluctuates. Cleans larger sizes, reducing manual picking.

LINK-BELT engineered, erected and initiated successful operation of this complete Heavy-Media plant

Included in the equipment supplied by Link-Belt for this Itmann plant, are the following major components manufactured by Link-Belt:

- 3 Float-Sink Concentrators
- 3 Media Thickeners
- 4 Multi-Louvre Dryers
- Rotary Car Dumper and Mine Car Handling and Dumping Equipment
- Shaker Screens
- Apron Type Loading Booms
- All Conveying and Power Transmisssion Equipment

Traveling louvres cause constant agitation of coal as it moves through the Multi-Louvre Dryer. Mixing plus constant aeration promotes fast, gentle, uniform drying. Accurate control is maintained at low temperatures.



LINK-BELT

COAL PREPARATION AND HANDLING EQUIPMENT

LINK-BELT COMPANY: Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington 9, W. Va., Louisville 2, Denver 2, Kansas City 8, Mo., Cleveland 15, Indianapolis 6, Detroit 4, Birmingham 3, St. Louis 1, Seattle 4, Toronto 8, Springs (South Africa).

12.944

"...has hugged the idlers perfectly, right from the start of operations"

says Supt. of Freeman Mine No. 4 about U. S. Ustex-Nylon Slope Belt

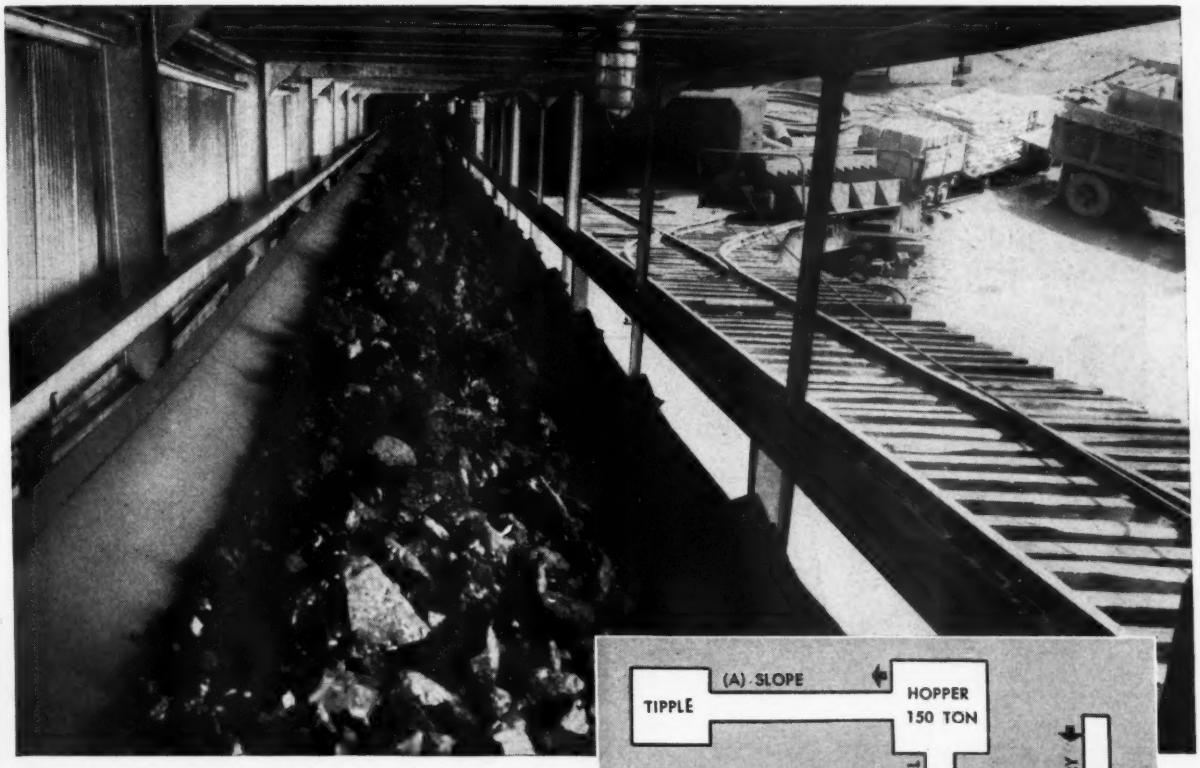


Photo shows U.S. Ustex-Nylon Slope Belt. Notice excellent troughability with perfect alignment.

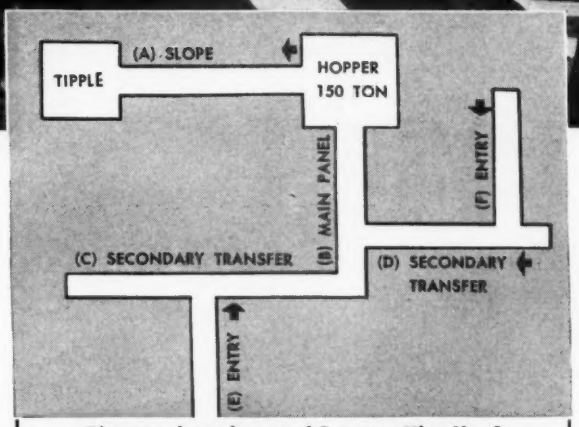


Diagram shows layout of Freeman Mine No. 4

(A) Slope Belt—42" x 6-ply U. S. GIANT® style CX-Ustex-Nylon.

(B) Main Panel Belt—42" 5-ply U. S. GIANT Style XN Ustex.

(C&D) Secondary Transfer Belts—36" 4-ply U. S. GIANT Style XN.

(E&F) Entry Belts—same construction as (C&D).

Look at the facts: A 42" belt, 1,330 feet center to center.

Capacity: 400 tons per hour. Lift: 360 feet. Speed: 300 feet per minute.

"Idler-hugging" troughability, perfect alignment and training result from the quality "U. S." builds into its conveyor belts.

In this highly mechanized, up-to-date mine, not only the slope belt but the gathering belts and the main haulage belt are all made by United States Rubber Company. The mine operator reports their performance is excellent in every way.

The belts supplied this mine are made of Ustex-Nylon and Cotton-Nylon, the two "U. S." patented developments which provide greater strength and flexibility. For steady, day-in and day-out dependability in conveyor belting, it will pay you to investigate the advantages of "U. S." Three-Way Engineering, in which "U. S." engineers work as a team with the mine engineers and the conveyor system engineers. Write to any of our 25 District Sales Offices, or write to address below.

"U.S." Production builds it
"U.S." Research perfects it
U.S. Industry depends on it

U.S. RUBBER
SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION · ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

Compact Westinghouse power centers give Silver Summit excellent voltage regulation because they were compact enough to be installed close to the load. Shipped as completely assembled and tested units, they reduced installation expenses.

Does this picture answer your mine's growing power problems?

If your power system isn't keeping pace with growing operations, you may get some good ideas from this Westinghouse installation in the Polaris Mining Company's Silver Summit mine in Idaho. Rapid growth, plus the discovery of new ore bodies, made the old distribution system inefficient and hazardous. Westinghouse helped the Mining Company's engineers plan a new 13,200-volt primary distribution system with underground power centers for low-voltage requirements.

13,200-volt system and power centers lick problems

The original 2400-volt system had high line losses because power was carried by long, cumbersome cables. Also, there was a serious thermal capacity problem because each piece of additional equipment put more load on already overloaded cables. Now, there is ample power for all present and future needs. By locating efficient Westinghouse power centers close to the load, short cables carry power where it's needed. Voltage regulation is excellent and thermal capacity problems don't exist.

Safety, dependability, low maintenance

Old oil-filled transformers and circuit breakers were mounted in any suitable space that could be found. Preventive maintenance was difficult due to the lack of flexibility in the system. As a result, there was a fire hazard because the breakers often failed to interrupt their rated capacities. Now, modern Westinghouse air-cooled transformers and air circuit breakers give Silver Summit absolute safety and dependability. There's no oil to explode, the units are foolproof, and require hardly any maintenance . . . just an occasional check.

Inexpensive installation

Installation costs were low because all Westinghouse equipment was shipped completely assembled, pre-tested and ready to hook up.

Westinghouse can help you plan your power system

Overloaded and outdated power systems are often causes of repeated trouble and costly delays in production. Ask your Westinghouse representative to help you plan a modern, trouble-free distribution system for your mine or surface plant. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-94985

YOU CAN BE SURE... IF IT'S

Westinghouse

"Save money? Sure!"

THAT, in a nutshell, tells you why so many wire rope users in the mines prefer Roebling wire rope . . . it speeds up operations . . . lasts longer on the job . . . saves money that really adds up.

For the last word in wire rope efficiency and economy, call your nearest Roebling office or distributor for a Roebling recommendation.

ROEBLING CF&I

A subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

Editorial Director
JULIAN D. CONOVER
Editor
JOHN C. FOX
Assistant Editor
GEORGE W. SALL
Associate Editors
G. B. SOUTHWARD
H. L. MOFFETT
W. I. POWELL

Mining CONGRESS JOURNAL

Production
B. C. WILKERSON
J. J. WARD

Advertising
P. D. McMURRER, Mgr.
FRANK W. MORAN
Chicago
RALPH F. DUYSTERS
New York City
RALPH W. HARKER
Los Angeles and San Francisco

Contents

VOLUME 39, NUMBER 10 FOR OCTOBER, 1953

FRONT COVER: Drilling a stope round at the New Brunswick Mine of the Idaho-Maryland Mines, Inc. at Grass Valley, Calif.

EDITORIAL 31

STRIP MINE ROAD CONSTRUCTION 32

SINKING IRON KING'S NO. 7 SHAFT 36
By E. R. TOMKINSON

BELT FIRE PREVENTION 38
By S. T. ALLSBROOK

STEEL RAIL SETS AT RESURRECTION 49
By WM. R. DOYLE

SCIENCE AND COAL 54
By E. ROSE

MORE ABOUT ORIENTED DIAMOND BITS CUTTING DRILLING COSTS 56
By WING G. AGNEW AND W. H. HAMPTON

WHEELS OF GOVERNMENT 59

PERSONALS 63

NEWS AND VIEWS 67

MANUFACTURERS FORUM 81

Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress

Indexed regularly by Engineering Index, Inc.

Copyright 1953, by

THE AMERICAN MINING CONGRESS
1102 RING BLDG., WASHINGTON 6, D. C.

HOWARD I. YOUNG, *President*
WORTHEN BRADLEY, *Vice-President*
ANDREW FLETCHER, *Vice-President*
WILLIAM J. JENKINS*, *Vice-President*
JULIAN D. CONOVER, *Exec. Vice-President and Secretary*
*Deceased January 12, 1953.

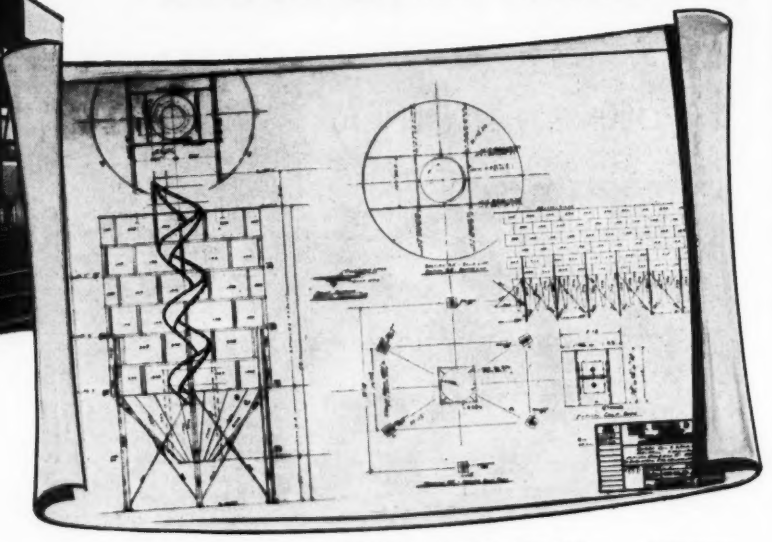
Published Monthly. Yearly subscriptions, United States, Canada, Central and South America, $3.00. Foreign, $5.00. Single copies, $0.30. February Annual Review Issue, $1.25. Entered as Second-class Matter, January 30, 1915, at the Post Office at Washington, D. C.

Member Audit Bureau of Circulations

HOLMES

COAL HANDLING AND PREPARATION EQUIPMENT

engineered to your individual needs...



THIS INSTALLATION of a Holmes Lowering Spiral and Coal Storage Bin (Steel Type) was made at the Jamison Coal & Coke Co., Mine 21, Hostetter, Pennsylvania.

It was preceded by a careful survey of the requirements and was *individually engineered* to do the job for which it was intended.

LOAD BINS FAST... AVOID BREAKAGE WITH HOLMES LOWERING SPIRALS

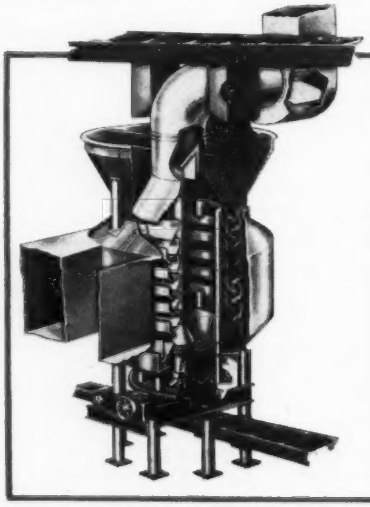
- **No droppage to degrade your coal**
- **No wear and tear on bins**
- **Costs nothing to operate** (gravity operated)

Robert Holmes Lowering Spirals are designed to lower material through the use of centrifugal force, thus eliminating the need of an inside retaining lip. Each spiral is formed like a well-banked race track. The coal automatically slows down when it reaches the "safe" speed limit, regardless of the distance of travel.

As there is no retaining lip, the coal slides gently off onto the peak of the pile to form a natural angle of repose. In this way, the coal is spread out uniformly . . . a real advantage where segregation is a problem.

Lowering spirals are essential to proper handling in surge bins, run-of-mine storage bins and pockets, mine retail sales bins, and consumer storage systems.

For free literature and complete details write Dept. C6



CONTINUOUS-FLOW ONE-PASS DRYING with *Baughman* VERTI-VANE THERMAL COAL DRYER

Both low in initial cost and operating cost . . . each Verti-Vane unit is designed for capacities from 15 to 75 tons. It handles all coal sizes from 1½" down. Reduces surface moisture to approximately 2% in a "one-pass" operation. Minimum of moving parts and slow-speed operation tend to eliminate shift breakdowns and lost time. Easily adjusted for feed conditions . . . requires little attention.

Write for Free Catalog No. 101 Today. Please address Dept. C6

ROBERT HOLMES & BROS., Inc. DANVILLE ILLINOIS

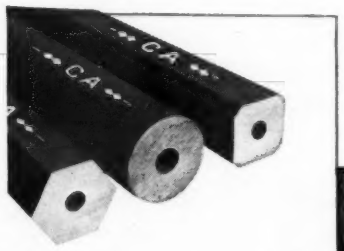
Manufacturers of: SHEAVES, TIPPLE EQUIPMENT, CAGES, SKIPS, LOWERING SPIRALS, CAR PULLERS AND RETARDERS, DRYERS, LABORATORY CRUSHERS, HOISTS, VIBRATING SCREENS, DUSTOLATORS.

they're using CRUCIBLE HOLLOW DRILL RODS on the Union Pacific Line Change

On this job, Crucible Hollow Drill Rods helped move 2,400,000 cubic yards of rock and make 118 major cuts. The largest cut was a huge bite 165 feet deep through solid granite.

That was the one-year record made on the 42 mile long Union Pacific Line Change, between Cheyenne and Dale Creek, Wyoming. To complete the job, largest since driving the famed golden spike joining East to West in 1869, took a combination of skill and teamwork by the Morrison-Knudsen Company . . . plus good equipment. And that's why Crucible Hollow Drill Rods were used.

Made to tool steel standards by the world's largest producer of special purpose steels, Crucible Hollow Drill Rods' *extra* quality means minimum rod breakage and fewer losses of valuable bits. You can be sure of long, uniformly dependable service, lot after lot, when you buy Crucible Hollow Drill Rods.



Visit us at Booth 241, National Metal Show, Cleveland, Ohio, October 19-23

CRUCIBLE first name in special purpose steels

53 years of Fine steelmaking

HOLLOW DRILL ROD

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REX HIGH SPEED • TOOL • REZISTAL STAINLESS • ALLOY • MAX-EL MACHINERY • SPECIAL PURPOSE STEELS

These Lungs Breathe—in Tons!

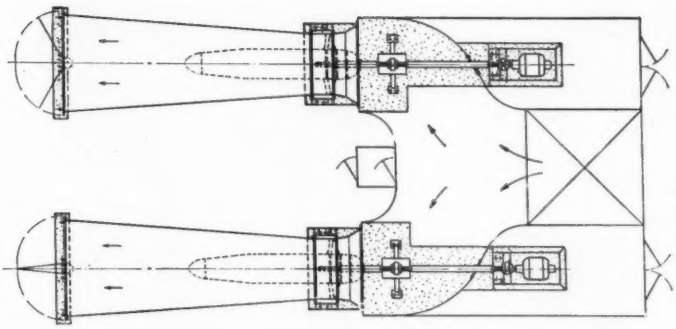
Jeffrey is the recognized leader in mine ventilation. Years of intimate contact with this problem have given Jeffrey unequaled "know how." Jeffrey AERODYNE Fans are custom-built for complete ventilation of mines requiring from 15,000 to 500,000 cubic feet of air per minute at mine pressures up to and including 20 inches.

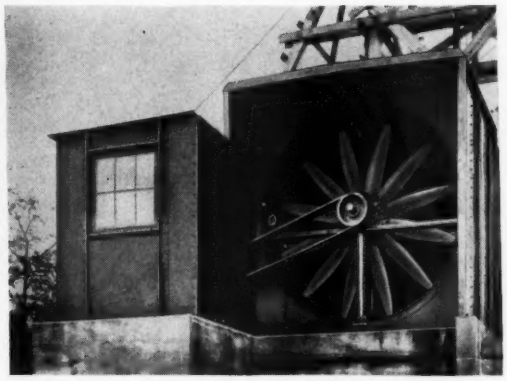
The Jeffrey AERODYNE 8H-96 Mine Fans shown above circulate 27,000 tons of fresh air per day—promoting *safety* throughout the mine. Jeffrey Ventilation Engineers are ready to help you install a system that combines maximum efficiency and economy.

AERODYNE FANS

FOR MAXIMUM MINE VENTILATION

At Right: Plan view of two Jeffrey AERODYNE Parallel Fans exhausting from an air shaft. These fans are direct-driven, equipped with close-off doors for independent operation of either fan.





Jeffrey AERODYNE Junior Fans (9-foot model shown above) are available in two types and various sizes for ventilation of mines requiring pressures not exceeding 4" water gauge. Self-contained for easy installation, operation and inspection.

Jeffrey Portable Universal Blowers and Exhausters are highly efficient for ventilating rooms, single entries, etc. Wide variety of motors, flexible tubing and fittings. All units self-contained. Available in open or permissible type. Type 61 Blower shown below.

WRITE FOR JEFFREY FAN CATALOG NO. 797

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

sales offices and distributors in principal cities

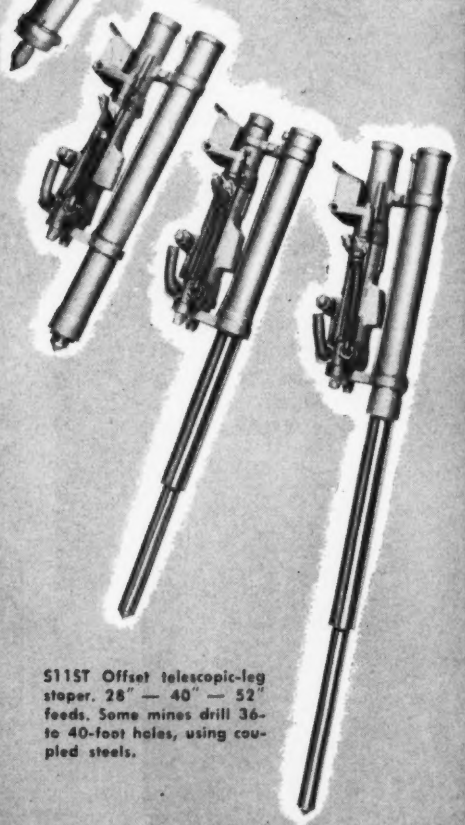
PLANTS IN CANADA, ENGLAND, SOUTH AFRICA.

IF IT'S MINED, PROCESSED OR MOVED

. . .IT'S A JOB FOR JEFFREY!

Here's

S11 on standard feed leg. Weight, 90 lbs.



S11ST Offset telescopic-leg stoper. 28" — 40" — 52" feeds. Some mines drill 36- to 40-foot holes, using coupled steels.

S11S Offset stoper.

Le Roi-CLEVELAND "Offset" Stopers

make roof bolting faster, easier

- **Complete range of sizes** for every mining condition including low coal.
- **Durability** keeps Le Roi-CLEVELAND Stopers underground.
- **Easy to handle** — fast drillers.
- **Trip rotation** lets you use the same stoper for driving roof bolts that you use for drilling.

why...

...stoping operations go faster and cost less, when you use Le Roi-CLEVELAND Stopers

FOR all raise or any uphole-work, drilling goes better with a Le Roi-CLEVELAND Stoper on the job.

Now, why is that? On the surface, a Le Roi-CLEVELAND looks pretty much like other makes of stopers. But—see a Le Roi-CLEVELAND in action. Actually use it. Then you can tell the difference.

It all boils down to one thing — Le Roi-CLEVELAND *design*. Right there, you have the basic reason why Le Roi-CLEVELAND Stopers produce extra footage per shift . . . why tonnages are greater . . . why mining and maintenance costs are lower.

Le Roi-CLEVELAND Stopers are available in 90- and 120-lb. sizes, to meet every mining condition. Ask your Le Roi representative for detailed information on the units that meet your particular needs. See him soon.

Write for free Bulletin No. RD25.

CLEVELAND ROCK DRILL DIVISION
Le Roi Company
A Subsidiary of Westinghouse Air Brake Co.
12500 BEREA ROAD • CLEVELAND 11, OHIO
Plants: Milwaukee, Cleveland and Greenwich, Ohio

Trouble-free performance is built right in

1. End-seating valve has short travel. Its snappy action provides powerful blow, strong rotation, and fast drilling speed. Air consumption is low and valve efficiency is not affected by wear.

2. Air-feed relief control trigger is close to operator's thumb as he holds the handle grip. Slight pressure on the trigger eases up on the air feed — more pressure drops the drill back slightly, or returns it to its fully closed position.

3. Inside of air-feed cylinder is polished, to provide free action and insure longer life for cup leathers.

4. Trip rotation lets the operator stop and start rotation at will — a big help in collaring the hole. It's a safety factor, too: When a steel sticks suddenly, the pull of the rotation on the operator's hand turns the hand-grip sleeve, stopping the rotation before the machine can cause injury.

5. Air-feed piston is an integral forged tube—not welded or brazed.

6. Constant blowing around the steel keeps cuttings out of the chuck.

7. Rotating sleeve and spacer are built to withstand wear and fatigue.

8. Efficient lubrication protects all surfaces, adds to the dependability of Le Roi-CLEVELAND machines.

QUICK SWITCH ARTIST!

Adaptable for hauling coal from the mine *and* men or supplies into it, a.C.f. Mine Cars speed production from the face to dumping point. a.C.f.'s exclusive Drop Bottom design further speeds production by permitting the nonstop unloading of coal at the rate of a ton a second.

a.C.f. Mine Cars never stop working. Any damaged car can be quickly switched to a siding where your own men can easily handle necessary repairs.

The complete facts are best measured in high speed production... the key to greater profits. Get the facts from your nearby a.C.f. Representative now. American Car and Foundry Company, New York • Chicago • St. Louis • Cleveland Philadelphia • Huntington, W. Va. • San Francisco Washington • Berwick, Pa.

a.C.f. MINE CARS

for Constant Haulage

O-B Ground Clamps are SHAKE-PROOF and PULL-PROOF!

Shake-proof, pull-proof O-B Ground Clamps let you forget about power interruptions and poor connection troubles. They really stay put on bonds, rail bases, or on feeder cables, so they keep return circuits and safety grounds connected.

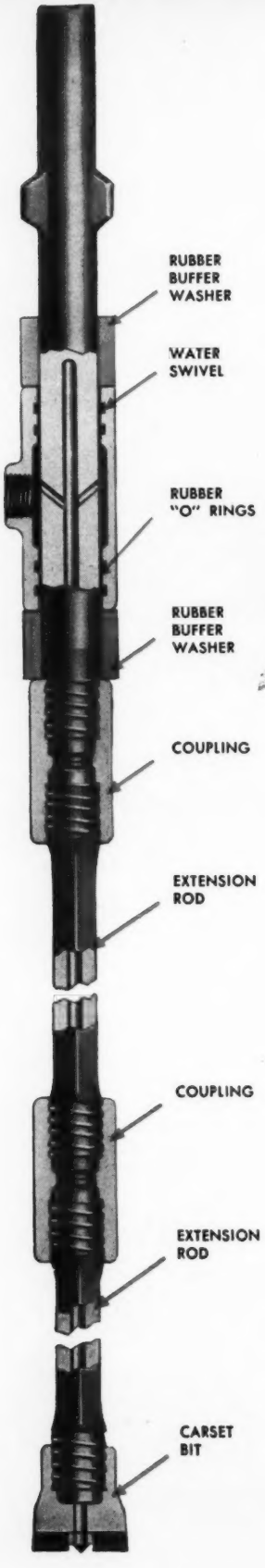
O-B Ground Clamps are safe, too! Cable terminals are well away from the users' hand and wrist. Heavy rubber handles give protection from shock if the clamp should be attached while the power is on.

One or two of these clamp styles should meet the grounding needs for your portable equipment. Let them banish makeshift, loose connections for your return circuits and safety grounds!

1. **Bulldog Rail Clamp**
   For machine cables as large as No. 2
2. **Standard Plier-Type Ground Clamp**
   For machine cable as large as 4/0.
3. **Junior Plier-Type Ground Clamp**
   For machine cable as large as No. 4.
4. **Bulldog Cable Taps**
   Available in three sizes, to grip feeder cables from 4/0 to 1,000,000 cir. mils. For machine cables as large as No. 1.
5. **Mine Rail Clamp**
   For machine cables as large as No. 2.

Ohio Brass

MANSFIELD OHIO



Everything you need for

LONG HOLE DRILLING

WITH

Carset Jackbits

Holes up to 100 feet deep are now being drilled faster and at much lower cost by this I-R Carset method

The longer-lasting, faster-drilling Carset Jackbit, with practically no gauge wear, has revolutionized deep hole drilling with I-R Drifters and coupled steels. The Carset method is not only much faster, but less costly than when using diamond drills. No special training is needed and the work can be done by regular miners with a minimum of supervision.

To permit the most efficient deep hole drilling with I-R Drifters and Carset bits, Ingersoll-Rand has developed and perfected a *complete line* of accessory equipment—including a water swivel that feeds hole cleaning air and water at high pressure directly into the drill steel without going thru the drill—a rugged, long-lasting coupling with the same threads as the bits—and extra-strong alloy steel extension rods.

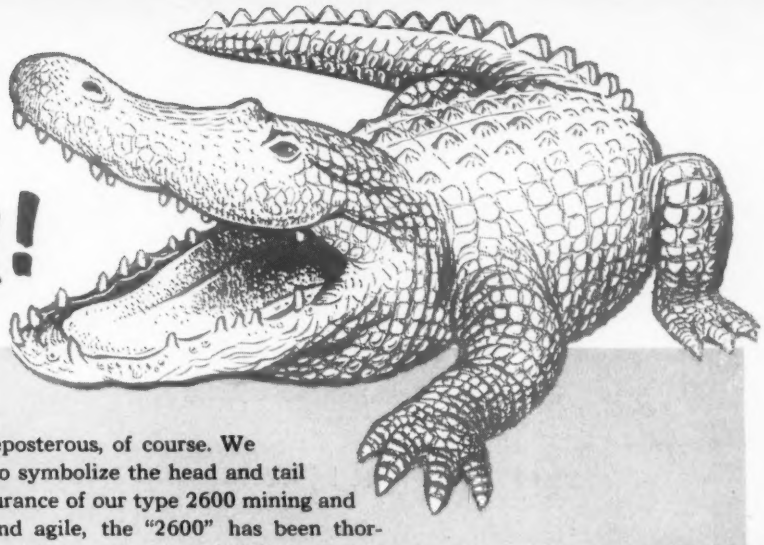
This combination of equipment, shown at the left, has proved remarkably successful in a host of deep-hole drilling applications. Ask your nearest I-R representative for the complete story. He can supply *everything you need*—from the bit all the way back to the compressor.

Ingersoll-Rand
11 BROADWAY, NEW YORK 4, N. Y.

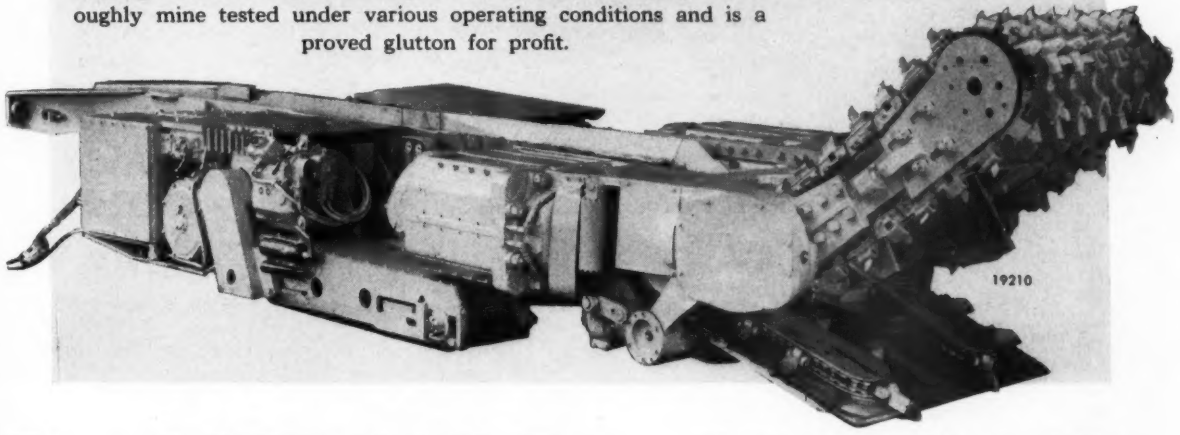
COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO BLOWERS • CONDENSERS
CENTRIFUGAL PUMPS • DIESEL AND GAS ENGINES

954-15

READY TO ATTACK!



A crocodile in a mine? Preposterous, of course. We picked a crocodile merely to symbolize the head and tail motion and the rugged endurance of our type 2600 mining and loading machine. Fierce and agile, the "2600" has been thoroughly mine tested under various operating conditions and is a proved glutton for profit.



The GOODMAN Type 2600 MINER

Here's how it works:

The Goodman Miner attacks the solid coal face with a 42"-wide, rotating, cylindrical head bristling with cutting bits and wedges. It sumps into the coal to a depth of 18 inches at the top of the seam and cuts downward. As fast as the mined coal is knocked down, it is picked up by the gathering head and conveyed back to the discharge end.

To complete a single cutting cycle takes an average of only 30 seconds. The average amount of coal cut and loaded out during this time is one ton. Swinging head and tail motion permits a mineable working width of 17 feet without maneuvering the machine on its treads. Crosscuts can be turned at right angles to room or entry.

Goodman
MANUFACTURING COMPANY
4834 S. Halsted Street • Chicago 9, Illinois

There's much more to tell about our new "2600" Continuous Miner—information that can make money, save money for you. Your inquiry is invited—without obligation on your part.

Cutting Machines · Conveyors · Loaders · Shuttle Cars · Locomotives · Continuous Miners

Compare!

THESE MODERN BUCYRUS-ERIES WITH OTHER SHOVELS

BOOM

Two-section — light upper section, rugged lower section. No excess weight. Weight and strength concentrated where needed and close to center of rotation.

Lower boom section integral with rest of machine, through twin strut connections to A-frame. Boom feet wide spread — no sway braces or cables. No boom jacking.

HANDLE

Single, tubular, one-piece, can rotate in saddle block. No handle twist possible.

SADDLE BLOCK

Cylindrical. Rubber cushioned against impact during fast plugging of swing. No binding with flexed dipper handles.

CROWD MACHINERY

Located forward on revolving frame, close to center of rotation. Position reduces swing inertia. Accessible, protected.

TYPE OF CROWD

Quiet, positive, independent rope crowd and retract. Adapts itself to tubular handle rotation — low friction — less crowd power required.

TYPE OF HOIST

Twin dual, single-part hoist ropes, one attached to each side of dipper. Power automatically concentrated where needed on dipper lip to break through bank obstructions. No dipper bail.

CONVERTIBILITY

Shovels fully convertible to draglines of the independent motor type — no operating clutches or brakes.

THESE FEATURES ADD UP TO . . .

- **BIGGER DIPPERS PER POUND OF SHOVEL WEIGHT**
- **MORE OUTPUT**
- **LESS DOWN TIME**
- **LOWER OPERATING COST**
- **BROADER APPLICATION**

42L 53C

THERE ARE MANY MORE REASONS WHY THESE MODERN BUCYRUS-ERIES ARE THE FINEST QUARRY AND MINE EXCAVATORS EVER BUILT. GET THE FULL STORY TODAY.

BUCYRUS-ERIE OFFERS

Front-end Construction

110-B	4½ cu. yd.
150-B	6 cu. yd.
190-B	8 cu. yd.

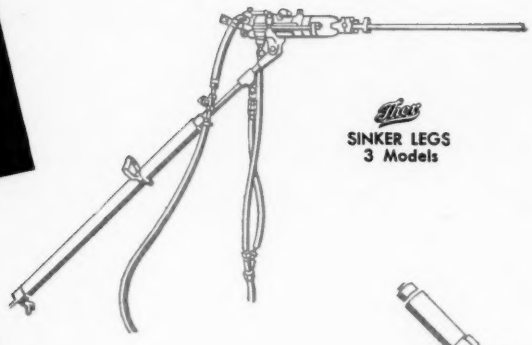
CONVERTIBLE
SHOVELS-DRAGLINES

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

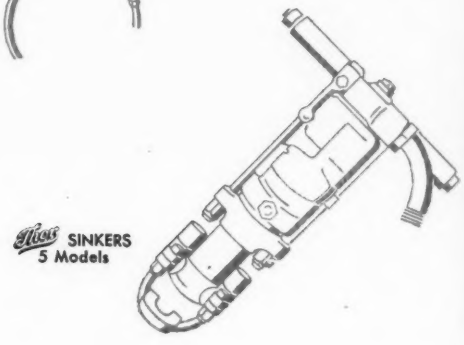
Reduce Mining Costs

with Thor ROCK DRILLS POWER FEEDS

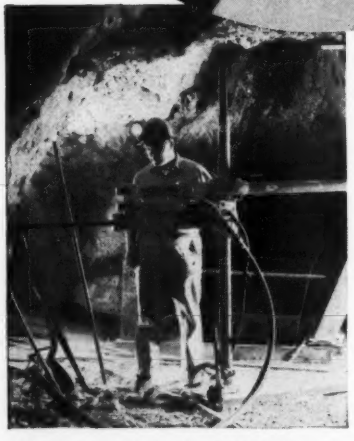


Thor SINKER LEGS
3 Models

No. 380
DRILLING
MACHINE

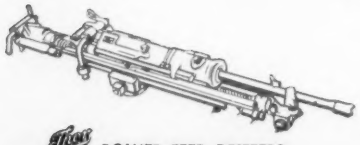


Thor SINKERS
5 Models



ABOVE, IN CIRCLE—No. 380 Drilling Machine with air-water backhead. 6 additional Sinker Leg models. IN SQUARE, Thor Air Bar Feed (4 models) and Thor Air Columns (3 models to 14 ft.).

BELOW: Thor Stopers, standard or reverse feed (6 models).



Thor POWER FEED DRIFTERS
3 Drill Sizes, 6 Shells to 60"+60"

For economies in blast-hole drilling, modernize with powerful Thor Rock Drills, supported and fed by the new Thor Power Feeds—developed for rapid set-up, quick steel change, and fast, low-cost drilling with carbide-tipped bits.

THOR ROCK DRILLS assure maximum use of your air power, plus long tool service and low maintenance costs.

THOR AUTOMATIC AIR FEEDS—air motors, air bars and air legs—provide maximum flexibility and power with complete safety and control.

WRITE FOR CATALOGS, INFORMATION OR DEMONSTRATION

THOR POWER TOOL COMPANY
AURORA, ILLINOIS

Export Division, 330 W. 42nd St., New York 36, N. Y., U. S. A.
Central America: Herramientas Thor de Mexico, S. A. de C. V., Basilio Badillo No. 47 Mexico, D. F. Mexico
South America: Thor Tool Hemisphere, Inc., Visconde do Parnahiba 1199, Caixa Postal 2899, Sao Paulo, Brazil
Western Europe: Thor Tool Continental, Inc., Nationhuis Jordaenskaai 25, Antwerp, Belgium

Thor PORTABLE POWER TOOLS

TOOL MAKERS FOR SIXTY YEARS

Here's versatile mining (and lubrication) in action!

SUPERLA
REG. U. S. PAT. OFF.
Mine Lubricants

● Coal is moved out fast when the continuous mining machine, shown above, goes into action in a midwest mine. This versatile machine literally chews coal from the face and loads it without preliminary cutting or shooting.

Here, too, is versatile lubrication in action. Two grades of SUPERLA Mine Lubricants (an oil and a grease) handle all of the major lubricant and hydraulic oil requirements of this large machine. Because these versatile products are fluid at low temperatures and resist thinning at machine-operating temperatures, they assure protective lubrication both when the machine is started cold and during long periods of continuous operation.

Transmissions and hydraulic systems have been kept clean and protected against wear. There have been no delays for warming up the machine. There has been no time wasted in applying the SUPERLA Mine Lubricants. The grease grade has poured readily from bung-type barrels and has been dispensed easily from hand-operated grease guns.

The Standard Oil lubrication specialist serving your section of the midwest can help you simplify lubrication and get better results through the use of SUPERLA Mine Lubricants. You can contact this man by phoning your local Standard Oil Company office. Or, write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

What's YOUR problem?

H. Dillingham, of Standard Oil's Evansville, Indiana, office, has helped this midwest mine gain an important versatility in their lubrication. Practically all of this mine's underground lubrication is handled by two grades of SUPERLA Mine Lubricants.

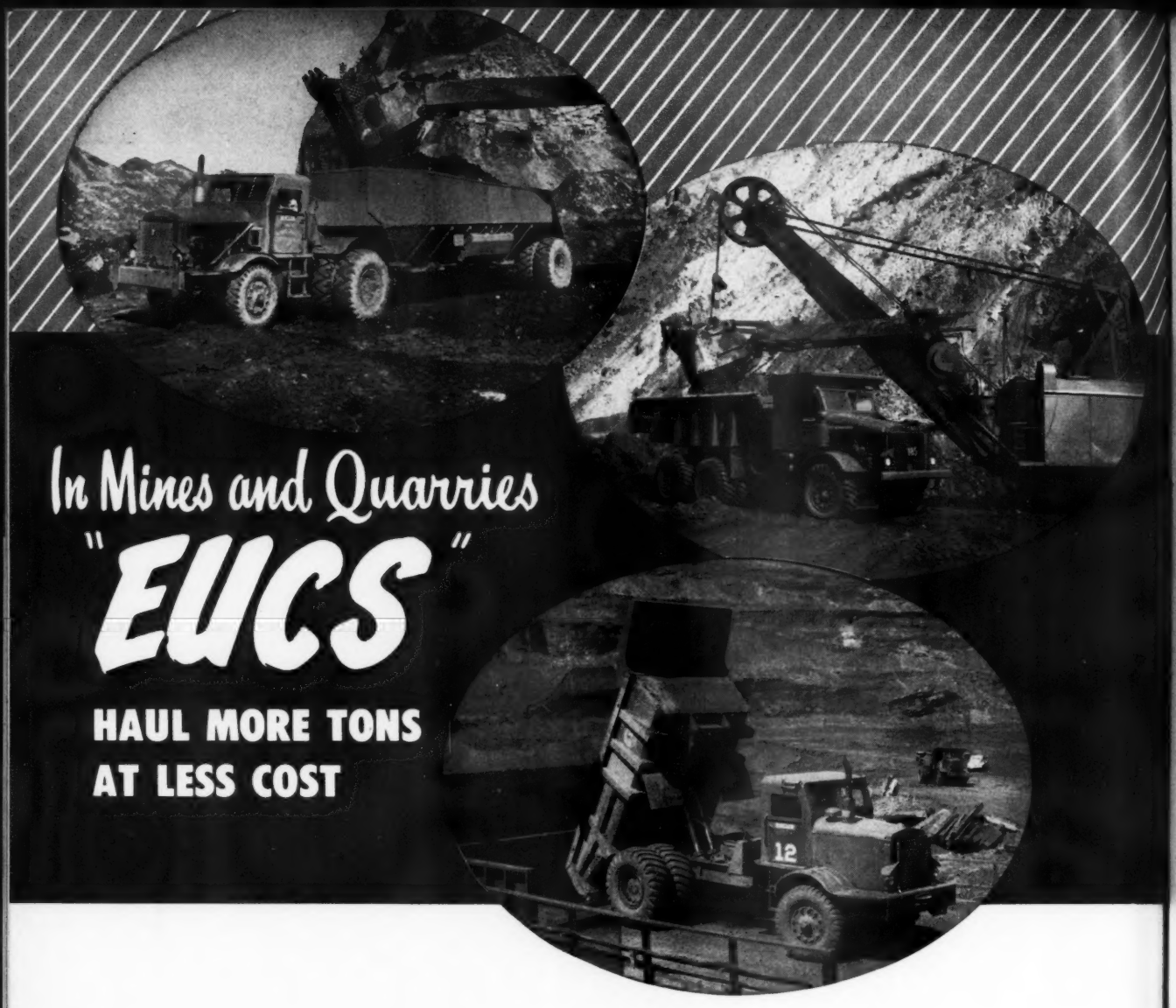
H. Dillingham is one of a corps of Standard Oil lubrication specialists located throughout the Midwest. These men are specially trained and have a wealth of practical experience to help you with your industrial or mining lubrication problems. One of these men is near your mine. You can reach him easily and quickly by phoning your local Standard Oil Company office. At no obligation to you, the Standard specialist will be glad to discuss savings that you can make with SUPERLA Mine Lubricants and such outstanding products as:

~~STANOIL Industrial Oils~~...Here's *one* line of oils that provides cleaner operation of loader and crane hydraulic units; supplies effective lubrication in compressors, gear cases, and circulating systems. One or two grades can replace a wide variety of special oils and lubricants.

~~CALUMET Viscous Lubricants...~~ On open gears and wire ropes, these greases strongly resist washing and throw-off. Their superior wetting ability affords better coating of gears and better internal lubrication of wire rope.

STANDARD OIL COMPANY

STANDARD *(Indiana)*



In Mines and Quarries "EUCS"

HAUL MORE TONS AT LESS COST

Built for tough off-the-highway hauling, Rear-Dump and Bottom-Dump "Eucs" have stepped up production and cut hauling costs on hundreds of open pit mining and quarry operations.

Euclids have proved their efficiency and long life in hauling a wide variety of materials . . . coal, ore, rock, overburden and other heavy excavation. Bottom-Dumps are powered by diesel engines of 190 to 300 h.p. . . . loaded speeds up to 34.4 m.p.h. . . . available in 20 to 40-ton capacities. Rear-Dump "Eucs" have travel speeds up to 36.3 m.p.h. . . . powered by diesel engines of 125 to 400 h.p. . . . range in capacity from 10 to 34 tons.

Your Euclid Distributor has performance data on jobs similar to yours. Ask him for a Euclid hauling cost estimate — there's no cost or obligation.

The EUCLID ROAD MACHINERY Co. • **CLEVELAND 17, OHIO**

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

3 GRADES OF SELECTED DIAMONDS

2 IMPROVED TYPES OF CAST-METAL MATRICES

2 MODERN POWDERED METAL MATRICES

DOUBLE-TUBE REAMING SHELL

Available in all standard sizes for use with all types of double-tube corebarrels. Special sizes and types as required. Inserts are tough tungsten-alloy matrix set with carefully selected diamonds.

SINGLE-TUBE REAMING SHELL

Available in all standard sizes for use with all types of single-tube core barrels. Larger sizes and special designs as required. In order to fill orders promptly for either single- or double-tube reaming shells we must know the make and model of the core barrel.

CASING-SHOE BIT

Available in the same wide range of sizes and types as our standard casing bits and designed so that they can be left on the end of the casing in the hole while drilling is continued through them with the corresponding standard size of core barrel and bit.

STANDARD CASING BIT

Available in all standard sizes with a choice of four different matrices and three different grades of selected diamonds. Larger sizes and special designs furnished as required. Must be removed before continuing to drill with core barrel and bit.

STANDARD CORING BIT

Available in four different matrices and three different grades of correctly-sized diamonds, EX, AX, BX and NX sizes carried in stock. Larger sizes and special designs furnished to meet any specifications or requirements.

ORIENTED DIAMONDS

MAKE SPRAGUE & HENWOOD BITS

CUT FASTER — LAST LONGER

Always a leader in its field, Sprague & Henwood, Inc. PIONEERED the development, and the production on a commercial scale, of "ORIENTED" Diamond Bits: in which each individual diamond is set with its hardest rib or "vector" toward the work.

As of the present date we have produced more than FIVE THOUSAND oriented bits, in a wide variety of types and sizes—with both cast- and powdered-metal matrices—and have proved, by extensive comparative tests in our own contract drilling operations, that they cut much faster and last much longer than bits in which the diamonds are set at random.

Natural aptitude, special equipment and long training are necessary before a setter can be relied upon to orient diamonds correctly in the mold but we are now fully organized to produce CERTIFIED ORIENTED DIAMOND BITS efficiently and will quote money-saving prices promptly on request.

CONTRACT CORE DRILLING

is a very important phase of our business. This includes exploratory drilling for coal and ore—also foundation testing for bridges, dams and other heavy structures. Experienced crews and supervisors are available for service anywhere in the United States and many other countries. Estimates submitted on request.

SPRAGUE & HENWOOD, INC. Scranton 2, Pa.

Branch Offices: New York—Phila.—Pittsburgh—Grand Junction, Colo.—Buchans, Newfoundland

IMPREGNATED CORING BIT

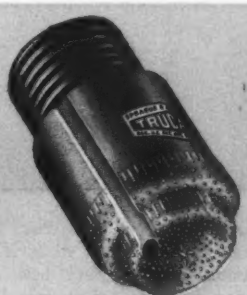
Especially suitable for drilling through hard, broken or extremely abrasive ground, where diamond loss from surface-set bits might be excessive. EX, AX, BX and NX sizes carried in stock. Larger sizes and special designs as required.

SERIES "M" CORING BIT

For use with Series "M" Double Tube Corebarrel as developed by Sprague & Henwood, Inc. to meet the need for a higher percentage of core recovery from soft, broken or friable material than can normally be obtained with a standard double-tube corebarrel. Available in all four types of matrix and three different grades of diamonds. Also in a complete range of "impregnated" type bits. EX, AX, BX and NX sizes carried in stock.

"CONCAVE" TYPE NON-CORING BIT

Especially suitable for drilling round smooth holes in relatively soft formations, when cores are not required. All standard sizes available in four different types of matrix.



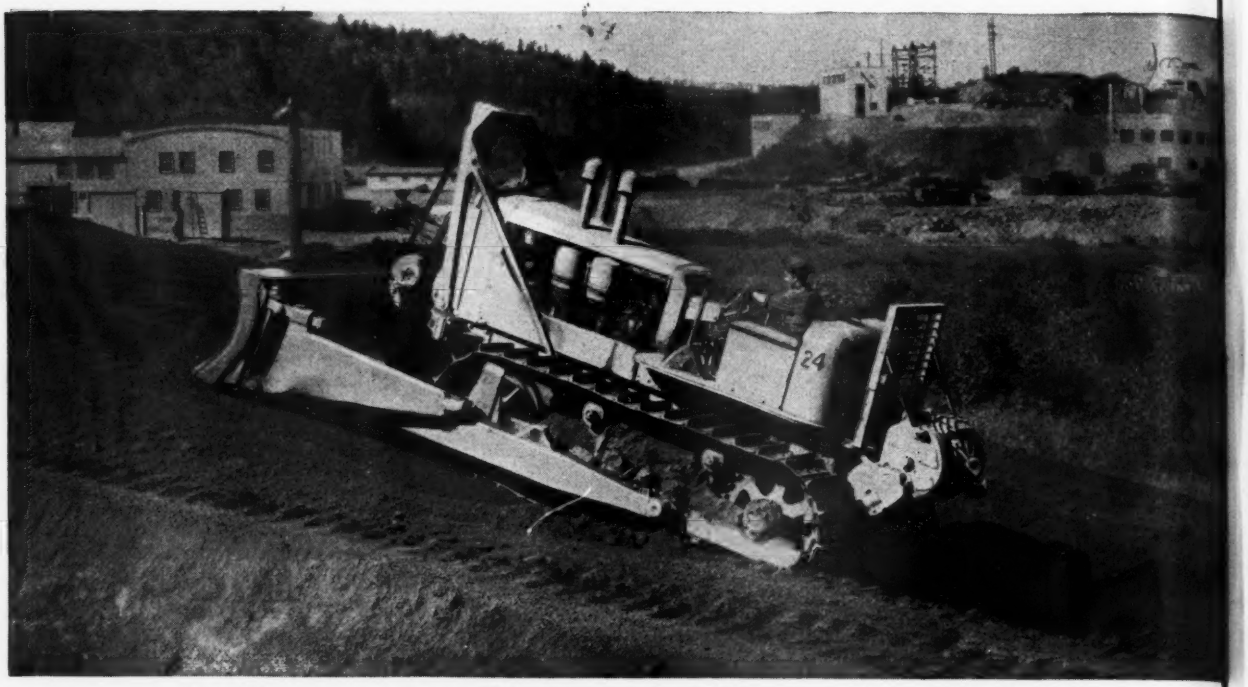
"PILOT" TYPE NON-CORING BIT

Recommended for drilling blast holes in hard formations and also for use when long straight holes must be drilled in variable formations.

"TAPER" TYPE NON-CORING BIT

The fastest cutting bit for drilling blast holes in very hard formations. All standard sizes.

NEW TRENDS IN MINING MECHANIZATION



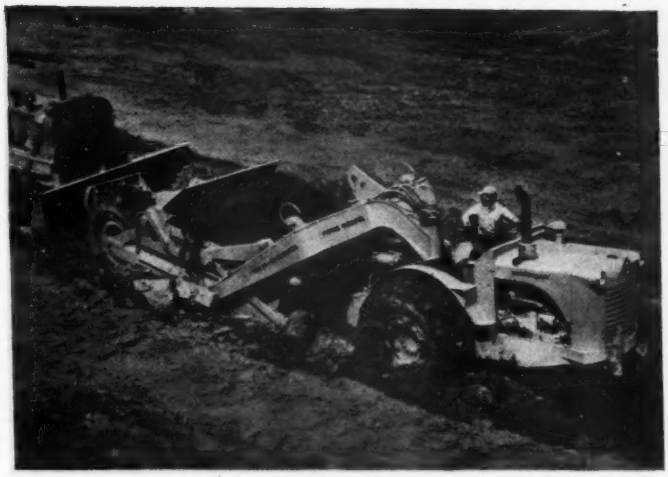
Stockpiles processed ore. HD-20 Tractor also builds access roads . . . maintains tailings dumps . . . cleans up around shovels . . . cuts drainage ditches . . . digs sludge basins and sluice-ways . . . builds reservoirs and pond dams . . . clears and levels building sites . . . tows equipment.

Loads ore underground. HD-5G Tractor Shovel also loads sand and gravel, other bulk materials . . . cleans up around conveyors and hoppers. Special materials buckets, bulldozer blades, other attachments available. Tractor shovels available for all sizes of Allis-Chalmers crawler tractors.

Builds and maintains haul roads. AD-40 Motor Grader levels pit bottoms . . . digs and grades for drainage . . . scarifies . . . prepares dragline sites. Gasoline-powered Model D Grader also available. Handles routine road maintenance — light construction, etc.

TODAY'S demands on mining production require the selection of equipment of the broadest versatility. Allis-Chalmers offers a complete range of material moving and handling equipment — including four sizes of diesel crawler tractors, motor graders, pull scrapers, high-speed Motor Scrapers and Motor Wagons — designed to fit your particular mining applications and to deliver the highest possible output.

Here are some on-the-job views with a few of the many ways in which these modern machines are speeding production and lowering costs.



Strips overburden. 13-yard heaped capacity TS-200 Motor Scraper also loads, hauls material from open pit . . . clears and levels for camp sites and drill setups . . . levels and grades building sites . . . hauls in supplies. Larger 18-yard heaped capacity TS-300 also available.

Hauls rock overburden. TR-200 Motor Wagon hauls tailings, sand, gravel, silicon, lead and zinc ore. Unit travels fast "off-road" with capacity loads . . . dumps clean every time with 18-ton, hydraulic-controlled rear-dump body. Sides channel-ribbed for rigidity.

Levels tailings dump. HD-20 Tractor with pull-type scraper also loads and hauls ore-bearing material — handles large-scale stripping jobs. Exclusive Allis-Chalmers hydraulic torque converter on HD-20 gives higher output, less upkeep on pulling, pushing and dozing work.

Complete line of pull-type scrapers available, from 2-yard to 18-yard sizes.

Your Allis-Chalmers dealer will be glad to analyze your equipment needs and help you select the right machines for your jobs. See or phone him soon to watch these machines in action.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

6 WAYS TIMKEN® BEARINGS CUT HAULING COSTS!

Proved on over half a million mine cars!

To cut the cost of hauling coal and ore, more than 500,000 mine cars are now rolling on Timken® tapered roller bearings. Here are 6 big reasons why:

1. GREATER RESISTANCE TO SHOCK LOADS. Timken tapered roller bearings are made of Timken fine alloy steel and case-hardened to provide a wear-resistant surface over a tough, shock-resistant core. They take the pounding of mine car service with minimum time-out for maintenance and repairs.

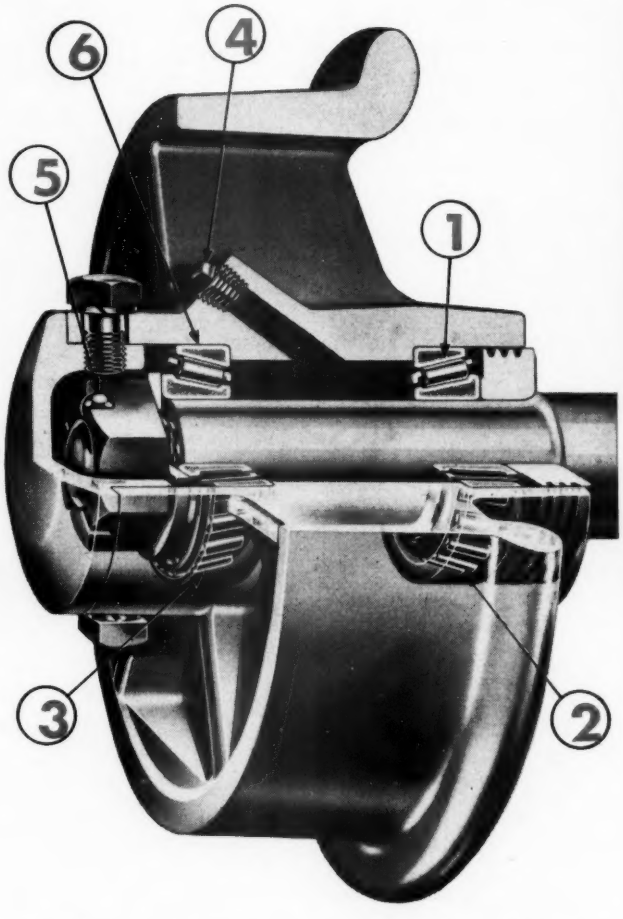
2. GREATER CAPACITY. Because of line contact between rollers and races, Timken bearings have extra load-carrying capacity.

3. EASY STARTING, LONGER TRAIN LENGTHS. True rolling motion and incredibly smooth surface finish of rollers and races in Timken bearings practically eliminate friction. More cars per train can be hauled with no increase in power requirements.

4. LESS LUBRICATION. Closures are more effective because Timken bearings keep hubs and axles concentric. Lubricant stays in—dirt and moisture stay out.

5. SIMPLIFIED INSPECTION. Wheels can be easily removed for bearing inspection by simply pulling the cap, cotter pin and nut.

6. NO NEED FOR SPECIAL THRUST PLATES. Timken bearings take radial and thrust loads in any combination because of tapered construction. No special thrust plates are required, cars take curves easier.



Get these cost-saving advantages for *your* mine cars by specifying Timken tapered roller bearings. Write The Timken Roller Bearing Company, Canton 6, O. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

Cut your hauling costs by specifying **TIMKEN** TAPERED ROLLER BEARINGS

TRADE-MARK REG. U. S. PAT. OFF.

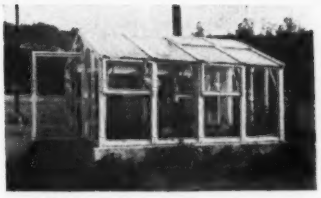
NOT JUST A BALL ◯ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ⇕ AND THRUST →◯← LOADS OR ANY COMBINATION

Here's how ROCKMASTER® reduces noise

The noise your neighbors hear . . . and complain about . . . is air blast. It is the noise of wasted explosive energy that escapes into the air before it has done its job on the burden. Such noise is difficult to avoid when holes are spaced too closely and detonation begins at the top. This waste of power occurs because the explosives force seeks the path of least resistance.

By allowing initiation at the bottom of the holes, the ROCKMASTER Blasting System can keep the explosives force under prolonged confinement . . . as shown in the above photos taken at the height of four different ROCKMASTER blasts. Each photo shows considerable movement of burden with practically no escaping gases.

To see how the ROCKMASTER Blasting System can improve your blasting efficiency and reduce noise at the same time, send for your copy of the booklet, "Overburden Blasting Techniques."



The North Jersey Quarry Company erected this greenhouse at its Millington operation, 400 feet from the working face, to prove that its blasts don't break windows. The reduced noise and vibration of the ROCKMASTER *system helps them improve community relations.*

ATLAS

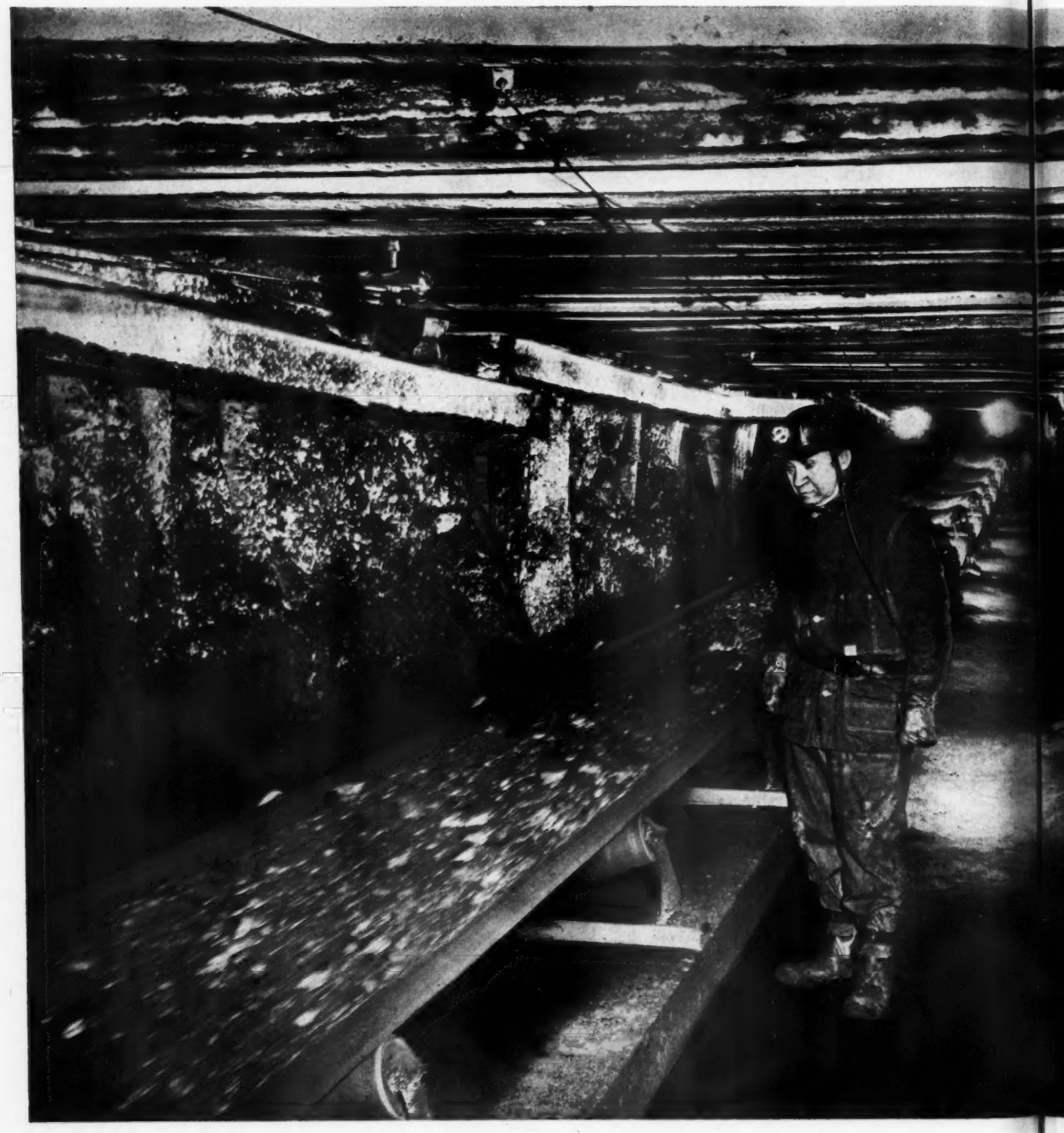
ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY, WILMINGTON 99, DELAWARE

Offices in principal cities

3½-Mile Conveyor System



HEWITT-ROBINS

EXECUTIVE OFFICES, STAMFORD, CONNECTICUT

Connects Face to Tipple

EQUIPMENT: 3½-mile long Hewitt-Robins Belt Conveyor System consisting of nine sections: six 30" standard heavy-duty underground mine conveyors, one 36" slope conveyor and two 36" surface conveyors.

LOCATION: Ebensburg Coal Company, Mine No. 1, Colver, Penna.

MATERIAL HANDLED: 12" maximum size, r.o.m. lump coal.

PERFORMANCE: This Hewitt-Robins Conveyor belt system handles coal at an average rate of 250 T.P.H. with peak loads running as high as 300 T.P.H. The six 30" underground conveyors operate at 400 F.P.M. and the 36" slope and surface conveyors, at approximately 350 F.P.M.

RESULTS: The performance of this installation has been quite satisfactory from the standpoint of both Operating and Maintenance Costs.

Engineering Data

MINE-TYPE SHUTTLE CONVEYOR: The answer to truly continuous mining . . . it follows the working face and at the same time maintains a fixed transfer point through a fixed tripper—unit is extendable and retractable up to 600'.

SECTIONALIZED MINE CONVEYORS: For main and panel entry haulage . . . available in 8', 10' and 12' sections with choice of 24", 26", 30", 36", 42" and 48" belt widths. Conveyor sections are selected to provide proper idler spacing to suit conditions.

ENGINEERED CONVEYORS: Designed to meet particular local conditions . . . available in belt widths from 16" to 72" . . . supplied with anti-friction idlers having 4" to 7" diam. pulleys. When required, 2½" offset, mine-type troughing idlers can be supplied where height limitations demand their use.

CHECK FOR INFORMATION ABOUT THESE JOB-TESTED PRODUCTS FOR YOUR OPERATION

CONVEYORS:
- ☐ —Belt
- ☐ —Dock
- ☐ —Mine
- ☐ —Shuttle
- ☐ —Slope
- ☐ —Vibrating
- ☐ —Fixed Tripper Shuttle

BELTING:
- *☐ —Elevator
- *☐ —General
- *☐ —Hot Materials
- *☐ —Raynile®
- *☐ —Steel Wrapper
- *☐ —Transmission
- ☐ —Woven Wire
- ☐ BUCKET ELEVATORS
- ☐ IDLERS

SCREEN CLOTH:
- ☐ —Electrically Heated
- ☐ —General

VIBRATING SCREENS:
- ☐ —Dewaterizers
- ☐ —General
- ☐ —Heavy-Duty Scalpers
- ☐ —Heavy Media

HOSE:
- *☐ —Acid
- *☐ —Air
- *☐ —Air Drill
- *☐ —Fire
- *☐ —Pinch Valve
- *☐ —Servall®
- *☐ —Steam
- *☐ —Twin-Weld®
- *☐ —Water
- *☐ —Water Suction
- *☐ —Flexible Rubber Pipe

- ☐ MECHANICAL FEEDERS
- ☐ STACKERS
- ☐ CAR SHAKEOUTS
- ☐ TRIPPERS
- ☐ BELT CLEANERS
- *☐ GROOVED PULLEY LAGGING
- ☐ CRUSHERS
- ☐ PICKING TABLES
- ☐ LOADING BOOMS
- ☐ RUBBERLOKT® BRUSHES
- ☐ MOLDED RUBBER PRODUCTS
- ☐ DESIGN AND CONSTRUCTION OF COMPLETE MATERIALS HANDLING SYSTEMS

*For immediate information about these industrial rubber products, call your Hewitt Rubber Distributor (See "Rubber Products," Classified Phone Book.)

Hewitt-Robins Incorporated
666 Glenbrook Road
Stamford, Connecticut

NAME

TITLE & COMPANY

STREET ADDRESS

CITY ZONE STATE 1428

INCORPORATED

DOMESTIC DIVISIONS: Hewitt Rubber • Robins Conveyors • Robins Engineers • Restfoam
FOREIGN SUBSIDIARIES: Hewitt-Robins (Canada) Ltd., Montreal • Hewitt-Robins Internationale Paris, France • Robins Conveyors (S. A.) Ltd., Johannesburg • EXPORT DEPARTMENT: New York City

Before you buy:

COMPARE CLUTCHES!

Two Link-Belt Speeder 2½-yd. K-580's speed stripping at this Canadian mine.

Speed-o-Matic controls pay off in less operator fatigue, more output, lower maintenance

Speed-o-Matic Clutch — Power is transmitted directly into the 3-shoe clutch. Mechanical linkage is eliminated, over 150 fewer wearing parts in clutches alone. Piston actuated clutch automatically adjusts for heat and normal lining wear.

THOSE rig-beating rock jobs aren't so tough when you've got a shovel like the 2½-yd. Link-Belt Speeder K-580.

That's because this rugged rig's complete power hydraulic control system and Speed-o-Matic clutch provide precise control . . . eliminate mechanical linkage . . . result in fast, smooth, shock reducing operation. What's more, maintenance costs are greatly reduced.

Speed-o-Matic controls are easy on the operator, too. Short-throw levers are finger-tip-operated. Think what this reduction in "end-of-the-shift" letdown means in additional output.

To get details on the K-580, see your distributor or write for Catalog 2287. For the complete line, request Catalog 2373.

LINK-BELT SPEEDER CORPORATION 13,156
Cedar Rapids, Iowa

LINK-BELT SPEEDER
CORPORATION
BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND WHEEL-MOUNTED SHOVEL-CRANES

FACTORY-TRAINED DISTRIBUTOR SALES AND SERVICE SPECIALISTS ...*EVERYWHERE*

When a fossil helps make land fertile...

Eagle-Picher's Celatom, or diatomaceous earth, works in modern ammonium nitrate fertilizers. Millions of years old, this fossil serves today as an anti-caking compound in plant foods.

Once a microscopic, single-celled plant, the diatom now appears in deposits as diatomaceous earth. Possessing a unique physical structure that makes it highly absorptive, Eagle-Picher Celatom is an excellent anti-caking compound in ammonium nitrate fertilizers—*keeps them free flowing.* High absorption is just one of the many unusual properties that makes Celatom useful in many different industries.

Many leading producers of ammonium nitrate fertilizer use Eagle-Picher's Celatom because they know they can depend on its uniform quality. There may be an application for Celatom and other Eagle-Picher products in your operations.

We'd be glad to talk it over.

EAGLE EP PICHER

EAGLE-PICHER

Since 1843

The Eagle-Picher Company • General Offices: Cincinnati (1), Ohio

A good name on any product. Widely known as an important factor in mining, smelting and processing of lead and zinc, Eagle-Picher provides many products for essential uses in the steel, paint, glass, ceramic, chemical, storage battery, automotive and farm equipment industries.
Among these products are: Slab zinc · Lead and zinc pigments and oxides · Molded and extruded rubber products · Diatomaceous earth products · Cadmium · The rare metals: Gallium, Germanium.
Mineral wool home and industrial insulations · Aluminum storm windows and screens.

Jensie Mine Plant

— OHIO DUPLICATE OF WARNER'S HIGHLY SUCCESSFUL R&S-ENGINEERED PREPARATION PLANT AT MAMMOTH, WEST VIRGINIA

The new Jensie Plant at Bergholz, Ohio—a duplicate of the Warner Collieries Company's Mammoth Washery at Mammoth, West Virginia—is engineered to give maximum production of premium washed coal in prepared sizes.

Raw coal from the famous Ohio No. 5 seam is crushed to 5″ x 0″. The 3/8″ x 0″ is screened out and bypassed for industrial use. The 5″ x 3/8″ is washed in an R&S Hydro Separator and sold as a premium coal.

Both the Jensie Mine Plant and the Mammoth Washery were engineered and constructed by Roberts & Schaefer Co.

ROBERTS & SCHAEFER CO. 130 N. Wells Street, CHICAGO 6, ILL.

PITTSBURGH 22, Pa., Henry W. Oliver Bldg.
HUNTINGTON 10, W. Va., P.O. Box 570
HIBBING, MINN., Box 675
NEW YORK 19, N.Y., 254 W. 54th St.
FOREIGN DEPARTMENT: International Mfg. & Equipment Co., Inc., 220 Broadway, New York 38, N.Y., U.S.A.

R&S AND COMPANY

Editorials

JOHN C. FOX, *Editor*

OCTOBER, 1953

Keep the Tails Down

PROBABLY only three Presidents of the United States have entered that office faced with problems as serious as those confronting Mr. Eisenhower. George Washington had to bind the colonies into one nation. James Madison had a war with Great Britain on his hands and Abraham Lincoln was faced with secession.

Dwight D. Eisenhower inherited, among other things, an artificially inflated economy at home, a hot war in Korea and a world distraught by cold war, looking for leadership it can trust. On how he solves the problems with which he is faced hangs not only the fate of this country but that of the entire world.

A major problem facing the administration on the home front is how to reduce spending. Without such a reduction there can be no over-all reduction in taxes. Governments like families or corporations cannot long endure unless they live within their means.

Over the last two decades a vast bureaucracy has grown up. In addition to the regular government bureaus and agencies, we have seen a host of other administrations and agencies, with a welter of confusing alphabetical names and titles, come and go—with more coming than going.

In theory many of these had ample justification for being. In practice they often operated at cross purposes and defeated their own ends with the result that the costs of government have mounted ever higher and with them the taxes needed to meet those costs.

On the theory that economy begins at home, the President with the authorization of Congress has appointed a commission, headed by former President Herbert Hoover, to study the reorganization of the executive departments of the Federal Government.

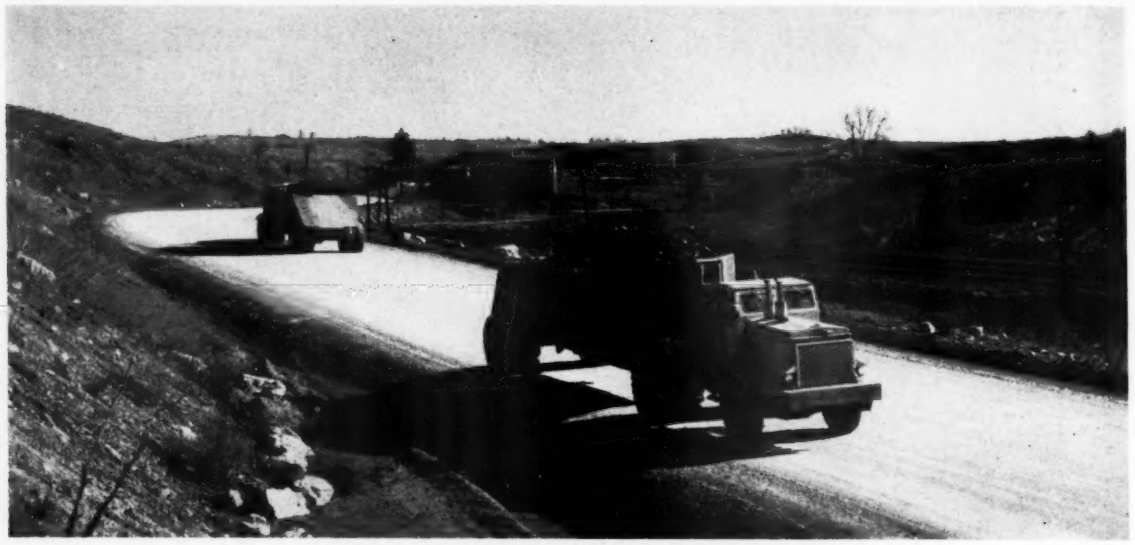
The guiding principle behind the studies and recommendations of this new Hoover Commission will be to eliminate duplication of functions. When its work is finished it should be possible to construct an organization chart delimiting the areas of responsibility of each streamlined department without any overlapping of authority.

The job facing the reorganization commission is not an easy one, nor one that can be done overnight. In a way it is similar to the examination of a mine operating unprofitably. In this case the ore body is a rich one. The Bureau of Internal Revenue is the mining department. It mines a certain amount of ore each year and has just about reached the limit of its ability to produce. Although the mill heads are pretty uniform, the ore entering the mill is processed through an extremely complicated flow sheet. Losses to tails are extremely high and a whole lot of the values go up the stack with the hot flue gases.

It is the job of Mr. Hoover and his staff of consultants to simplify the flow sheet. They must make recommendations to management for realigning the machinery; for discarding obsolete units; for making adjustments; for changing reagents; for picking out serviceable units and using them to best advantage.

We in mining, along with all other Americans, are the stockholders; Congress is the board of directors and the President and his Cabinet are management. As stockholders we have a definite stake in the outcome of the commission's investigations. We should therefore be ready to render our full cooperation in assembling data for task forces or committees studying Government agencies dealing with public lands, minerals and the mining industry.

When the flow sheet has been drawn up and approved and each unit is functioning smoothly, we can expect the governmental mill to show a higher recovery with less metal in the tailings pile and fewer stack losses.



Roads like this mean no delays in hauling coal from pit to tipple

Strip Mine Road Construction

Building a Mile and a Half of Road Per Year Capable of Carrying 90-Ton Loads Is No Small Job. Here Is How One Coal Company Does It.

A STRIP mine is no better than its roads! Of course, it is no better than the drilling, shooting, stripping, loading, or all the other jobs that make an efficient mining operation, but a good haulage road system is needed to keep the coal moving. The magnitude of a road-building program around a strip mine is revealed when one compares its load-carrying requirements with those of a first-class Federal highway. The American Association of State Highway Officials has set an axle load of 18,000 lb as the upper load limit for which first-class highways in the United States should be designed. Some individual states use a slightly higher figure and some use a slightly smaller figure, but 18,000 lb is the figure used for Federal highways.

At the Hanna Coal Co. Division of Pittsburgh Consolidation Coal Co. in eastern Ohio, strip mine roads have to carry up to 75,000-lb axle loads. That is the axle load of the company's new 53-ton capacity trucks when fully loaded—a gross weight of over 90 tons per loaded truck. Ten of these trucks, along with smaller haulage units, transport 5000 tons of coal per shift. Truly, our country's strip mine roads are carrying traffic that would ruin the best public highway in the United States.

At Hanna, long among the leaders in advancing strip mining techniques, the development of good roads has received its fair share of attention. This is as it should be. They have not yet arrived at the final answer in their road-building program but feel that good progress has been made in this direction. Perhaps there is no final answer.

First, Careful Planning

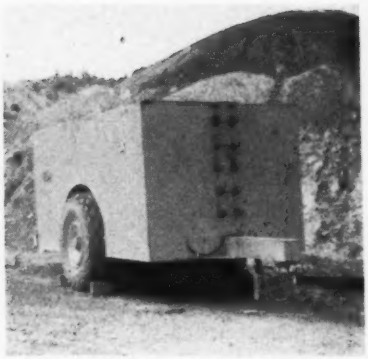
In any story of good roads there are several chapters; with planning, construction, and maintenance being the most important. At Hanna first steps toward any new road construction are taken in the drafting room. Here, where future mine operations are planned, much work is done in locating roads to provide the most direct route possible to the cleaning plant or tipple. At the same time, roads are planned to interfere as little as practical with stripping.

A road that runs straight as an arrow from mining area to tipple at a grade of approximately 1 percent in favor of the loads is the ultimate in road planning. This, of course, is not always possible, but is a good goal to work toward.

After a preliminary road location has been decided upon during the planning stage, cross-sections are

Tractor pulled, wheeled scrapers grade down the high places and fill in the low

Where necessary, culverts are put in to assure proper drainage



A 50-ton capacity steel box mounted on four tires is used to test the sub-grade for weak spots

made along the selected right of way to establish yardage costs in bringing the road bed to tentative grade lines. These costs are then balanced against known truck performance over established grades. Maximum speed of the haulage trucks in each gear ratio is considered and may dictate that grades be increased or decreased. In the final analysis, the question is one of economics, and grades are governed by truck performance over the estimated length of time that the road will be in operation, against grading costs. Some of the roads at Hanna have required cuts as deep as 55 ft and fills as high as 40 ft. Grades are always kept below 8 percent.

After the location of the new haulage road has been decided upon, the engineer corps takes over. All haulage roads are located by survey, with stakes set for alignment, curves, grades, cuts, fills, etc. Curves are banked to take truck traffic at maximum speed.

Actual construction work is confined to the summer months whenever possible. Tractor-pulled scrapers are used to bring the sub-grade up or down to the proper elevation. They do the heavy work in making four-lane highways out of spoil banks.

Overburden taken from the first cut of coal is the favored sub-grade material. There is some silt in this material, but it does not appear to be detrimental. Recent tests by the Civil Aeronautics Administration showed that this first cut overburden has an average density of 110 lb per cu ft at a moisture content of 18 percent. Other materials which might be suitable for sub-grade have not been tested since the available overburden does the job well.

Drainage Important

An important part of the road building program is the construction of ditches and culverts. Open ditches, 3½ ft below the edge of the sub-grade, are maintained on each side of the road. Culverts are built where necessary. Realizing that good drainage is extremely important in the maintenance of a desirable road system, company engineers stress the importance of keeping ditches open and water away from the road.

Wherever fills are needed, they are built up in layers. Tractor-pulled scrapers are used to carry the material into the fill area. This is well compacted with a sheep's-foot roller. If needed, the material is watered to allow compaction to maximum density. This is not usually necessary, as the overburden generally retains enough moisture to allow maximum compaction. As the fill is being built up, a wheeled compactor is used to find any weak places in the sub-grade. The compactor, which is nothing more than a large steel box mounted on rubber tires with oscillating axles, is used on the top three to five ft of fill.

Engineers locate all roads by survey and give cut and fill measurements

Fills are built up in layers, using available overburden which is then compacted

Wheeled scrapers do the heavy work

A sheeps-foot roller packs fill material to maximum density

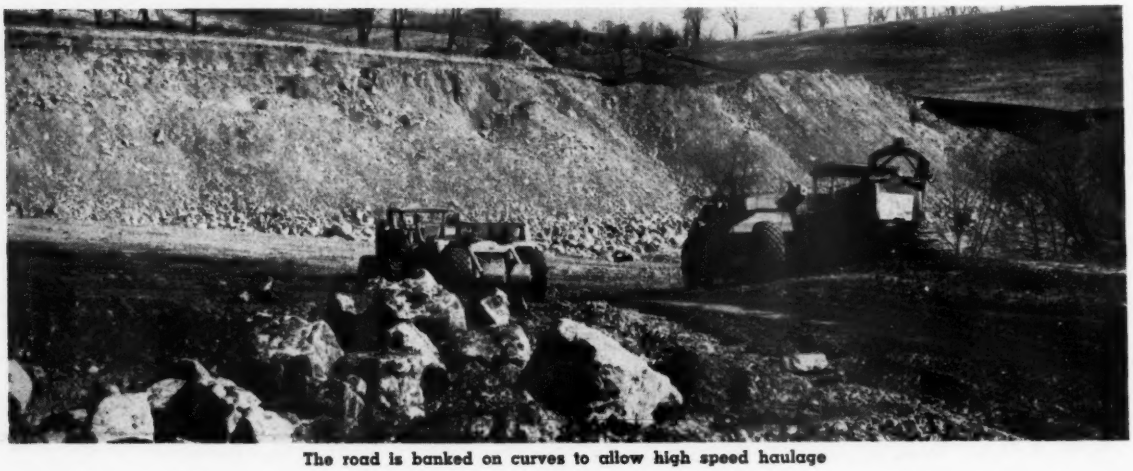
The box has a capacity of 50 tons and is mounted on four tires. If any weak spots are located, the faulty material is removed and satisfactory material replaced. Next to drainage, adequate compaction of the sub-grade is the most important consideration in the eyes of Hanna road builders.

When the sub-grade is up to the proper elevation and has passed inspection, it is paved with limestone from Hanna's own limestone plant. First, three in. of tailings are laid down. Tailings is the name given to the refuse product of the plant. It is a dense graded material ranging from ¾ in. to minus 200 mesh in size. The tailings are compacted by the rubber-tired supercompactor. A three-in. layer of 1¼-in. plus material is laid on the compacted tailings and choked with a ¾ in. by ⅜ in. graded aggregate. Choking makes a denser pavement, as it tends to fill in the voids of the 1¼ in. plus limestone. It is interesting to note that the first layer of limestone uses smaller stone than the top layer. This is the reverse of usual practice. The pavement receives its final compaction with truck traffic. In this way an average of 1½ miles of haulage road are constructed each year.

Finished roads are 40 to 60 ft wide and are well crowned, the berm being 1 to 1½ ft lower than the center on a 40-ft road.

Good Maintenance

Maintenance is a continuing operation. During dry weather the roads are watered as necessary, the water-truck making as many as five trips a shift over the same piece of road. Where the road-metal wears thin, maintenance crews re-dress the road with ¾ by 1¼ in. limestone, which is tail-gated on by dump trucks. This material is then worked into the original road by a road-grader. Ditches are kept open by road-graders to insure that any overabundance of water is promptly carried off.



The road is banked on curves to allow high speed haulage

This completed sub-grade is ready to be surfaced with limestone from Hanna's own limestone plant

available at nearby steel mills in Weirton, W. Va., but has to be trucked a distance of about 35 miles. In June, 1952, two more strips of hard-surfacing were laid. Material going into these strips also met T-35 requirements, but this time limestone was used instead of mill slag. One of the strips was two in. thick and the other three in. thick. The two 1952 test strips are still holding up, but surface wear can be observed. The hard surfacing was experimental only and no conclusion has yet been reached as to its comparative value in haulage road construction.

As mentioned earlier, Hanna has not yet arrived at the final answer in its road-building program. But at the present time their roads are doing everything they are asked to do and in no way limit coal production. And

Not only do coal-haulage roads have to be constructed and maintained, but it is also necessary to reconstruct state and county roads that have been abandoned to allow the underlying coal to be stripped. When the roads are reconstructed, they have to be in as good condition as they were originally and must pass rigid inspection by the county road commissioners. This part of the road-building program is also taken care of by the regular road builders, and the same procedure is followed as in making haulage roads.

Table 1—Composition of Ohio T-35A hot asphaltic concrete surface.

Stone Size	Upper and Lower Limits—Percent Weight
1 by ¾-in.	0- 5
¾ by ½-in.	5-20
½ by ⅜-in.	7-30
⅜-in. by 4-mesh	10-35
4 by 6-mesh	0-10
6 by 50-mesh	20-45
50 by 200-mesh	3-15
Minus 200-mesh	0- 5
Bitumen (asphalt)	5- 9.5

Note—Between 50 and 60 percent of the material must be plus six mesh.

Try Black-Top Roads

There has been some experimentation with hard-surfacing haulage roads at Hanna. In June, 1951, a piece of road near the cleaning plant, 200 ft long by 36 ft wide, was hard-surfaced with asphalt, meeting Ohio specifications for a Type T-35A hot asphaltic concrete surface as outlined in Table I. No 1 by ¾ in. material was used, the top size being ¾ in. This piece of road has held up very well and shows little wear at the present time even though it has been in steady use. The hard-surfacing was put down in a four-in. layer on top of an eight-in. base of two-in. mill slag, which in turn was choked with smaller mill slag. Mill slag is readily this after all is perhaps the best yardstick. It is surprising to note not many of the rules, curves, or formulas adopted by the U. S. Army or other agencies for runway and road design are used by the road builders. Rather they have relied upon their own experience and ingenuity to build roads able to meet all the demands of the operating department.

Roads really have to be good to bear up under such traffic as this 53-ton capacity truck

Iron King Mine and Mill at Humboldt, Ariz.

Sinking Iron King's No. 7 Shaft

Unique Method Used in Putting Down 2000-ft Shaft Allowed Work to Be Carried On From Several Levels at the Same Time

By E. R. TOMKINSON

Mine Superintendent
Iron King Mine, Shattuck-Denn Mining Corp.

AFTER an extensive diamond drilling program at Shattuck-Denn's Iron King lead-zinc property at Humboldt, Ariz., it became apparent that the deposit persisted to a depth beyond which the present hoisting equipment could adequately service. Because of this it was deemed necessary to either enlarge the present ore shaft or sink another. The obvious disadvantages of lost production time ruled out trying to "remake" the presently undersized main shaft. After careful analysis of the situation, it was decided to sink a four compart 6 ft 8 in. by 22-ft steel and concrete shaft to be located 420 ft northwest of the present main shaft. This location would place the new shaft well into the hanging wall and aimed to intersect the vein zones at the 15th level, giving a good "center of gravity" to deeper level workings. It is proposed to initially sink this new No. 7 shaft to a depth of 2000 ft. At this time the shaft has been sunk to the 1400-ft level.

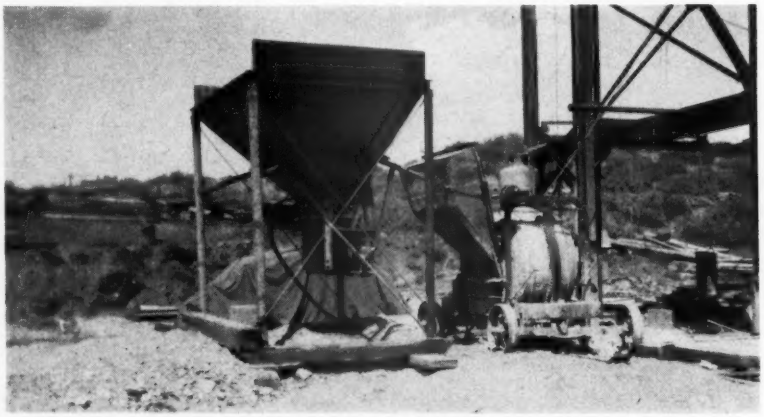
Increased labor costs and the fact that the old-time shaftman with the round-point shovel is practically extinct dictated that mechanical mucking or other equally efficient methods would have to be used.

In new shafts in virgin country, mechanical mucking is the answer, but where the shaft is to be sunk relatively close to the mine workings and connections are needed, raising and raise stripping is feasible. With this system the waste material can be drawn underground and used for backfilling in the stopes that are being gobbed. After due consideration, it was decided to sink the No. 7 shaft by raising and raise stripping.

Sink and Raise

After the location of the shaft with respect to the ore body was decided, preliminary work began on both surface and underground. A 16-in. churn drill hole was to be drilled from the surface to a depth of 300 ft, while a crosscut was driven on the 3rd level and raising was begun from the 6th, 7th and 15th levels. Because of trouble encountered by the churn drill, the pilot hole was much slower than expected, and as soon as the crosscut on 3rd was advanced to the shaft location a raise was driven up and met the hole 50 ft above the 300 level. The raise on the 15th level was continued to the 13th, and as soon as the raise from the 7th to 6th level was completed, one was started from the 8th to the 7th level.

The reason for this scrambled raise program was that the 14th and 15th levels were in early stages of development and the raises would serve for ventilation and escape until the regular raises could be driven—which was to be several months in the future. The work on the 7th and 8th was to provide a transfer to these levels where the waste material could be dumped into the gob system.



Concreting began after the 300-ft station was cut

After installing a temporary hoist and headframe, placing the collar set, and erecting the necessary surface buildings was completed, actual sinking on the 16-in. churn drill hole was begun on a two-shift basis. The entire operation to date has been carried out on a two-shift basis with each shift consisting of one hoistman, four shaftmen and two trammers for removal of the muck on the lower levels.

Shaft sets, on 6-ft centers, consist of 22-ft wall plates, 6-ft 8-in. end plates, 6-ft posts, and 5-ft 8-in. dividers. The wall plates, end plates, and dividers are 6 in. H beams while the posts are 4-in. angle irons. All of the H beam pieces have welded butt plates and the entire set is bolted together. All steel is prefabricated in the Iron King shop. Only six posts were found necessary in this four-compartment shaft.

Pull Six-Ft Rounds

A 6-in. H beam, 20 ft long, was suspended in the churn drill hole by a 1-in. cable and lowered to the bottom of the round before blasting. A 6-ft round, consisting of 42 holes, was drilled using two Ingersoll-Rand J-50 Jackhammers and I-R Carset Bits. Blasting was done with electric primers. After the blast, the beam was pulled through the muck with a small single drum tugger set up in about the center of the shaft. After the hole was opened and the muck around the beam was barred and picked to the angle of repose, flooring was laid and the steel set was lowered and blocked in line. After removal of the flooring, a 5-hp slusher was lowered from the surface and stulled from a divider. Muck was removed from alternate ends of the shaft by slushing into the centrally located hole. Steel sets followed the sinking closely, leaving just enough room to place wall plates.

This procedure continued through 80 ft of alluvium and 25 ft of decomposed schist. Very little trouble was experienced to this point, with the hole in some instances actually being open following the blast. However, when the dense schist was encountered, the rounds had to be shortened to three ft with the same number of holes for better fragmentation. Obviously this was not quite as efficient as a 6-ft round but did not slow the sinking as much as was expected. A three-ft round could be drilled and blasted in less than one-half shift.

Raise stripping below the churn drill hole was carried on in about the same manner, except the slusher was not needed for mucking the bottom. The waste in the raise was pulled down enough to hold the round and the shaft bottom was practically cleaned by the blasting.

Bearers of steel and concrete were placed at 300-ft intervals. Due to the fact that the shaft is concreted all the way, and has added stability since its long dimension is at right angles to the schistocity, this large bearer interval was felt justified.

Concrete from Level to Level

No concreting was done until after completion of the 300-ft station. Following the station cutting, the first bearers were placed and concreting started upward from that point. From then on the stations were poured and concreting continued—a set at a time from the stations to the level above.

Following is a table of costs for 1400 ft of shaft below the collar set—192 ft of stripping of 16-in. churn drill hole and 1208 ft of stripping raise. The figures shown in this tabulation are direct costs only.

The stripping of the 16-in. churn drill hole was primarily experimental. Some difficulties were encountered from lack of experience and proper technique. However from experience gained from 192 ft of stripping, it was found that this method could be used to advantage up to 300 to 350 ft in depth. In longer holes, trouble may be encountered in case of hang-ups. In distances not to exceed 100 to 150 ft, raises are probably more efficient.

The cost of $27.73 for raises shown in the table is the average cost of 1600 ft of raise work and includes the cost of the longer raises over 125 ft. At about this point, efficiency begins to go down and costs up.

Success of sinking on a hole of this size depends largely on the men in the bottom, and of course, the character of the ground. It is felt that in this case it was an advantage; especially since 6-in. pilot hole was to be drilled for ventilation for the long raise.

When No. 7 shaft is completed, it will be possible for the Iron King to increase its production from 750 tpd to at least 950 tpd.

Completed headframe of the No. 7 Shaft

COST PER FOOT OF IRON KING NO. 7 SHAFT

	Labor	Explosives	Steel	Concrete	Timber Misc.	Total
Sinking (Incl. Drill. Blast., Muck., Tram.)	$48.53	$6.68				$55.21
Steel Sets	11.60		$29.15			40.75
Guides, Ladders, Platforms	2.70				$6.70	9.40
Concrete	22.32			$28.65		50.97
Raises	22.38	2.26			3.09	27.73

Iron King No. 6 shaft, with No. 7 in the background

A well maintained installation and good housekeeping are needed to assure proper fire protection

Belt Fire Prevention

A Report of the Committee on Conveyor Mining Covering Belt Fire Hazards, as Illustrated by Actual Occurrences and Describing Protective Devices that Will Prevent Fires from Starting

By S. T. ALLSBROOK
Subcommittee Chairman

WHILE the development and growth of underground belt conveyors has contributed to better safety records in many cases, new hazards have been introduced and mining men must be on the alert to guard against the danger of mine fires. Belt conveyors contain three possible combustibles—(1) belting, (2) lubricants and (3) power cables. In addition, coal dust, timber, oil spillage, discarded insulated wiring and other waste accumulations, if present in the belt entry, can add fire hazards that are more serious than those presented by the belt itself. In fact, most fires originate in these outside sources and then spread to the belting.

In presenting this report, the committee first submits the following measures as fundamental in belt fire prevention and suggests that these points should be given careful consideration in the formulation of a fire protective program.

(1) Determine what causes a fire.
(2) Eliminate the cause or at least reduce it.
(3) If the cause cannot be eliminated, then install protective devices wherever practical.
(4) Formulate and enforce practical rules that are easily understood for operating, maintaining and moving belt conveyors.

Causes of Belt Fires

When considering the first item in the foregoing list, experience has shown two principal fire origins—mechanical (friction) and electrical. These can be amplified as follows:

Friction at the drive pulley or at the idlers can generate enough heat to start a fire. However, a running belt seldom ignites even when passing over an extremely hot roller or burning coal dust. The fire starts when the belt stops. In many instances, an inspection patrol might discover the danger while the belt is still in operation. Friction may be due to:

(1) Poor alignment causing belt to rub against idler support.
(2) Drive pulley running with belt stalled.
(3) Obstruction in belt, holding the load stationary while belt continues running.
(4) Torn belt wrapped around pulley or idlers.
(5) Stuck idlers.

Electrical defects can cause heating and fire in the wiring insulation short circuiting the safety devices, and allowing power to remain on when the belt is slipping. These defects may be due to:

(1) Faulty starters.
(2) Improper electrical installation.
(3) Short circuit of power wires.

First step in eliminating causes for belt fires is to see that correct installation methods have been used and that correct operating practices are being followed. The following discussion covers briefly the particular points which should be kept in mind.

Installing Belt Conveyors

The head and drive, intermediate sections and tail piece should be set to survey lines established for alignment and grades. The best results are obtained when the belt is leveled across the line for the entire length. The best method for adjusting tension is the use of a dynamometer and applying a pre-determined tension. However, in one mine an experienced

key installation foreman has been setting the belt tension without instruments with good results where the belts are on short life production entries. This mine is noted for "good housekeeping" and belt maintenance men are on regular patrol along the conveyor.

Operating Belt Conveyors

Operating standards vary from mine to mine but there are a few fundamentals which should always be observed—in whatever manner mine management may decide.

Cleanliness (good housekeeping)
Proper drainage
Timbering
Dust control

CLEANLINESS—This requires a regular maintenance set-up. Periodic inspection and immediate reports to the proper officials should be made of all substandard conditions.

All belt entries should be kept clean of loose material, and coal dust, oil, grease, etc., should be removed when necessary from the belt head, tail piece, and loading points.

Breakthroughs should be clear of obstruction, especially at points where stoppings are provided with doors.

Live power cables should not be allowed to pile.

Dust, coal and slate should be kept cleaned off belt framework and replaced rollers, tools, or other material should be removed from the conveyor entry. A well kept belt entry is a moral uplift to the men working on the inby section. Many instances have been noted where good housekeeping and safety practices in a clean, well kept, belt entry have been reflected at the active working faces. Most miners will be influenced by the examples they see while going to and from their places.

DRAINAGE — Belt entries should be clear of standing water, muddy conditions, and water should not be permitted to drip on conveyors and belts. When it is not considered practical to eliminate local standing water, the belt frame should be blocked sufficiently to be in the dry. Provision should be made so men do not have to walk through water in the travelway.

TIMBERING—Federal and State requirements set most standards. However, roof or other conditions may require additional safeguards to protect men and equipment.

COAL DUST CONTROL — Rock dust laws of the various states and the Federal Coal Mine Inspection Code should be the minimum requirements. Careful checks should be made to see that there is rock dust at critical points for use in emergency. Coal dust in the air should be held to a minimum by controls at all transfer points of coal if necessary.

Protective Devices

Electrical controls are of maximum importance to prevent fires that might otherwise be caused by ineffective or no electrical protection. All power lines should be properly installed with usual facilities for preventing overloads, short circuits, etc. Desirable special controls for belt operation to eliminate fires are as follows:

(1) A device to prevent motor overload.

(2) Sequence control of belts in series.

(3) Automatic stop in case of belt slippage or break.

(4) Automatic stop and start controls at feeder belt discharge to prevent coal pile ups.

(5) Adequate circuit breakers.

Emergency remote control switches or other suitable controls should be located at loading and unloading stations and at intervals with lights marking their location. Some mines use a continuous wire control system along the belt line so that a man can stop the belt at any point along the line. This system has an advantage in that it is not necessary to travel any distance to get to a switch or button.

Accounts of Belt Fires

To supplement the foregoing discussion on causes and preventive measures, the following brief accounts of actual underground fires will tend to show the effectiveness of protection devices and the need for proper installation, operation and maintenance practices.

Account A

In moving some equipment, a short circuit occurred in a trailing cable. This caused a flash fire in the cable which was piled at the side of the belt; the flames enveloped the heading and ignited coal dust alongside the conveyor.

Any tendency of coal dust to accumulate in a belt entry should be checked by good housekeeping and such material removed. Furthermore, live power cables should be used extended and not allowed to pile.

Account B

A sudden roof fall on top of a conveyor caused the drive pulleys to slip due to the belt being wedged by the rock. The slippage released smouldering fabric into oil and dust that was alongside the drive. A fire resulted.

Two hazards were present; (1) coal dust and (2) oil were allowed to build up along side of the conveyor drive. As in Account A, coal dust or oil accumulations should have been removed by good housekeeping. However, in this case, an automatic stop to prevent belt slippage would have prevented the fire.

Account C

A slate fall tore down power wires, hung on a row of posts parallel to the belt conveyor. The wires were short circuited and fell on the conveyor setting fire to the belt.

Power wires should be located far enough from the belt so they cannot fall on it. Extra precautions should be taken if it is necessary to cross over the belt with the power line. In addition, circuit breakers should be used in the power circuits.

Account D

The conveyor was jammed when a loose piece of belt wrapped around the return roller under the belt and after passing around the roller forced the top belt up until a fastener caught against a cross brace. Friction between the stalled belt and the moving drive pulleys started a fire at the drive.

An automatic stop that operates in case of belt slippage or break would have prevented this fire. Also, careful inspection would probably have discovered the loose piece of belt before it was caught.

Account E

An idler pulley on one side of a belt line became stuck. Heat generated by the resulting friction caused the belt to catch fire.

Residual grease or coal dust at the idler probably ignited first and set the belt on fire when it stopped running. While the conveyor was in motion the cooling effect between periods of contact with the stuck idler kept the belt below its ignition point.

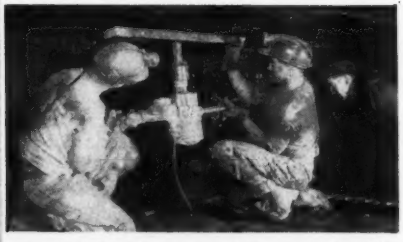
Fire Extinguishing

The purpose of this report has been to discuss fire prevention and not to cover fire extinguishing which is a broad subject in itself. However, the committee suggests that a belt entry should have fire fighting equipment of some nature, such as water lines, hose, automatic sprays, chemical devices, etc. The type of equipment is of course for the management to decide, as a number of considerations are involved.

This is brought up here because a fire extinguisher can be a fire preventive. It has been said that "all fires are the same size for the first five minutes," and on this basis, stopping a small fire in a belt entry might well prevent its growing into a large fire. Then there is another factor. As the foregoing report describes, a belt fire may be a long while in building up—that is, heat may be generating but combustion may not develop until after the belt has stopped running. In such case, preliminary evidence by smoke, odors, etc., would indicate that a belt fire was in the making and the belt could be stopped and the extinguisher brought into play before anything serious developed.

300% More Bolt Holes per Bit!

Simple roof drilling rig consists of cap or pan (for holding drill) mounted at end of double-strength steel bar which is used as lever in notches of steel fulcrum. As bit penetrates roof, lever is raised to next notch.



By applying Kennametal Sintered Carbide Rotary Bits in this operation, the mine is able to drill and bolt with the same equipment. Drill is also fitted with Kennametal Bits and used at the face for blast holes.

Leechburg Mining Company's Park-Armstrong Mine uses Kennametal Sintered Carbide Bits to get substantially lower costs for roof drilling in its 32-inch seam. Hard, tough Kennametal Bits average *fourteen* 2-foot holes per sharpening—*over three times* as many as other carbide bits could drill!

Until Kennametal was used, it was impractical to rotary drill this roof. Now, a simple rig has been devised so that drillers can readily install longer drill rods to keep pace with drilling speeds.

Kennametal Sintered Carbide Bits can reduce costs in ordinary conditions and solve drilling and cutting problems where conditions are severe because (1) Kennametal has shock- and wear-resistance superior to any other tungsten carbide and (2) Kennametal Representatives—veteran mining men with years of actual mining experience—go into the mine to demonstrate the right bit for the job.

Look for the name of your Kennametal Representative in the yellow section of your phone book, or on the back of your Kennametal Price Book — or, write direct.

WORLD'S LARGEST MANUFACTURER OF TUNGSTEN-CARBIDE

DRILL BITS, CUTTER BITS, ROOF BITS, STRIP BITS

KENNAMETAL®

KENNAMETAL INC., MINING TOOL DIVISION
BEDFORD, PA.
GENERAL OFFICES and MAIN PLANT at LATROBE, PA.

AMERICAN Container-Cartridges Clearly End-Labeled

AC-55
DYNAMITE
25 LBS. 5 x 30
N-5820

FOR EASIER SELECTION!

American Explosives' popular 25-lb. shipping-loading container-cartridges are now easier to use than ever.

Strapped in bundles of two for shipping and handling convenience, each cartridge is clearly end-labeled so that you can choose the right strength for the shot.

Experienced shooters know that there's nothing like these American container-cartridges for easy loading, sure shooting and for bringing down just the right breakage. Available in a wide variety of densities, velocities and strengths, American Explosives are in stock at plants and magazines in key spots throughout the country. Next time order American!

Capable Field Engineers Are Available At Your Call

*High Explosives • Permissibles • Blasting Powder • Blasting Accessories

AMERICAN CYANAMID COMPANY
EXPLOSIVES

AMERICAN Cyanamid COMPANY

EXPLOSIVES DEPARTMENT
30 Rockefeller Plaza, New York 20, N. Y.
Sales Offices: Pittsburgh, Pa., Bluefield, W. Va., Scranton, Pa., Chicago, Ill., Pottsville, Pa., Maynard, Mass.

Naturally you want

TRUE CORES

. . . and you want them **FAST**

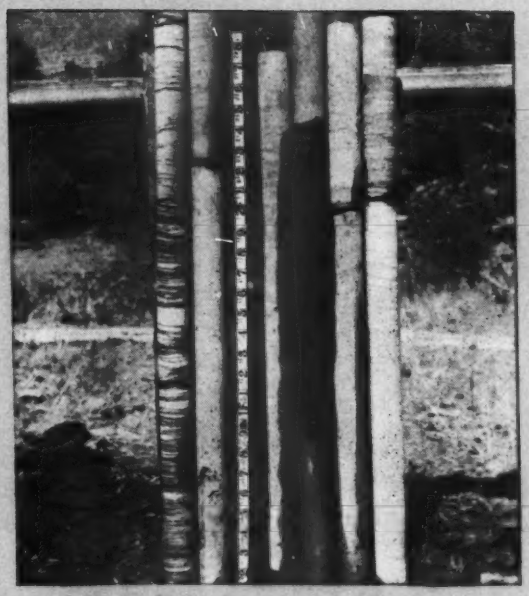
and at **LOWEST COST**

SO . . . **WHY NOT BET ON A SURE THING . .**

On the strength of the story told by these cores, a new mine was opened and became a big producer. With a Joy Diamond Core Drill, it was a simple matter to analyze and measure these cores and determine, precisely, the mineral content, size and value of the deposit.

Prospecting can be done at a fraction of the cost and in much less time than any other method. There are many other uses for Joy Diamond Core Drills, too. They're great for blocking out ore bodies, testing sub-surface foundations and completed structures, and drilling holes for pressure grouting, underground drainage, ventilation and gas relief.

For full details on Joy Diamond Core Drills, write for bulletins to **Joy Manufacturing Company, Oliver building, Pittsburgh 22, Pa.** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*



USE JOY DIAMOND CORE DRILLING EQUIPMENT

THE JOY 22-HD is a heavy-duty drill that's rugged, portable and versatile. It's direct-driven with four-speed transmission—either hydraulic or screw-feed swivelhead. An easily-operated, rugged, but sensitive hoist that handles strings of drill pipe up to 2000 feet and operates at hoisting speeds up to 290 feet per minute. Details in Bulletin D-28.

THE JOY 12-B is a highly efficient drill that can be quickly dismantled into four compact units for convenient transportation. With a capacity of 1000 feet, its versatility and portability make it ideal for the other duties required of a sturdy drill. Available on skid or column mounting for surface or underground operation. Skid mounted model uses either hydraulic or screw-feed swivelhead. Details in Bulletin D-21.

CORE DRILLING BY CONTRACT

Complete core drill contracting service by highly skilled crews is available for mineral prospecting, blocking out ore bodies, testing foundations, drilling grout holes, etc. Write for full details.

TRUCO AND JOY-TRUCO DIAMOND BITS AND REAMER SHELLS

Sales and Resetting Service throughout the World by Joy Manufacturing Company

Consult a Joy Engineer

JOY

W&B M467

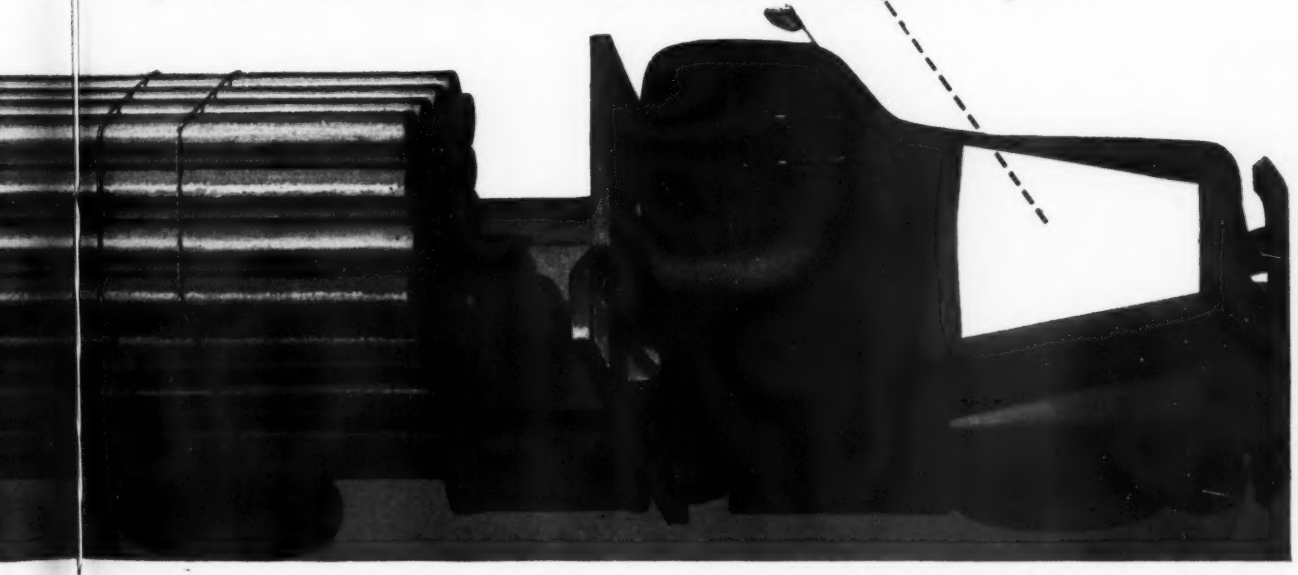
WORLD'S LARGEST BUILDER OF CORE DRILLS, ROTARY BLAST HOLE DRILLS AND MOTORIZED DRILL RIGS

If you operate medium heavy-duty trucks ...

This new 150 h.p. diesel <u>now</u> makes Cummins

CUMMINS

performance and economy available to you



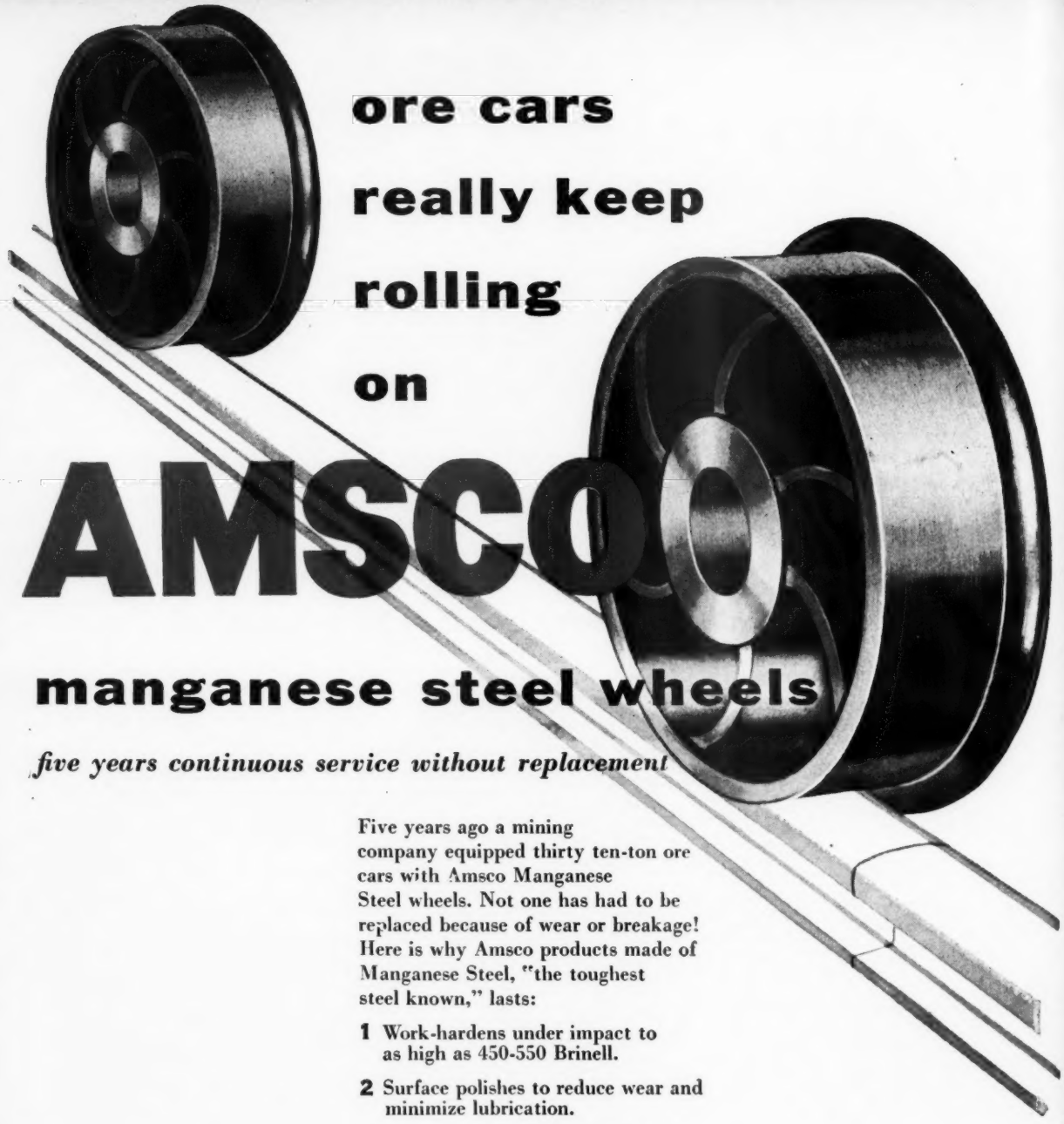
It's Cummins new Model JBS-600—ready to serve in the medium heavy-duty trucks produced by leading manufacturers. Ready to bring to this field the performance that has made Cummins the leader among high-output diesels. 150 h.p., the JBS-600 delivers full rated power for faster acceleration . . . for reserve stamina when the going is tough.

JBS-600 operators report more miles per gallon . . . lower fuel costs. This demonstrates the fact that Cummins' exclusive fuel and injection system—together with four-cycle operation and use of inexpensive Number 2 diesel fuel—naturally leads to savings on the job. The JBS-600 is ready to work profitably for you. It's Cummins-engineered for a long and useful life.

For all the facts—see your Cummins dealer!

Cummins® Engine Company, Inc. • Columbus, Indiana

Leaders in rugged, lightweight, high-speed diesel power



ore cars really keep rolling on AMSCO

manganese steel wheels

five years continuous service without replacement

Five years ago a mining company equipped thirty ten-ton ore cars with Amsco Manganese Steel wheels. Not one has had to be replaced because of wear or breakage! Here is why Amsco products made of Manganese Steel, "the toughest steel known," lasts:

1 Work-hardens under impact to as high as 450-550 Brinell.

2 Surface polishes to reduce wear and minimize lubrication.

3 12 to 14 percent Manganese for strength and ductility.

and it's easily weldable with Amsco Hardfacing Alloys

Write Amsco or ask your ore car builder for information on how Amsco Manganese Steel wheels can help you keep production rolling.

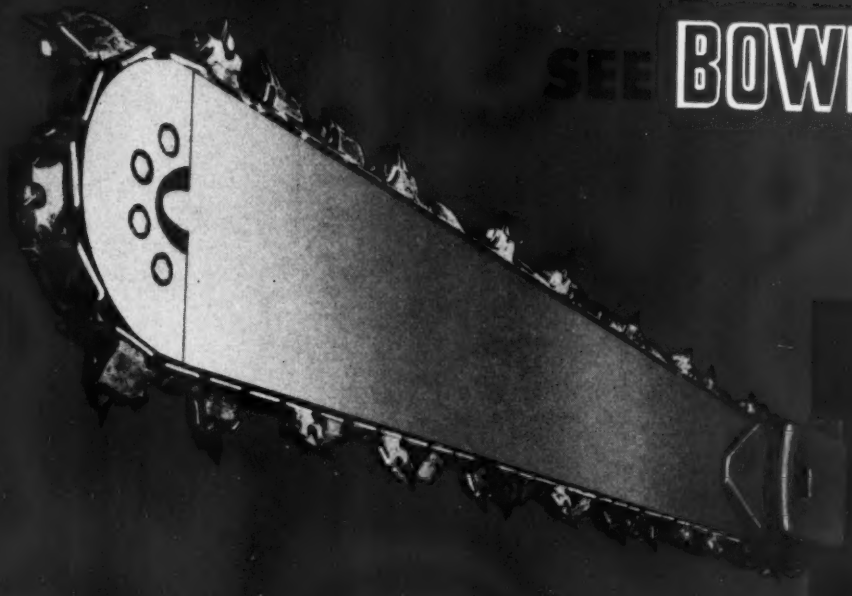
AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

422 East 14th Street · Chicago Heights, Ill. OTHER PLANTS: NEW CASTLE, DEL., DENVER, OAKLAND, CAL., LOS ANGELES, ST. LOUIS. IN CANADA: JOLIETTE STEEL DIVISION, JOLIETTE, QUE. AMSCO WELDING PRODUCTS DISTRIBUTED IN CANADA BY CANADIAN LIQUID AIR CO., LTD.

coal cutting costs make you see Red ?

SEE BOWDIL* . . .



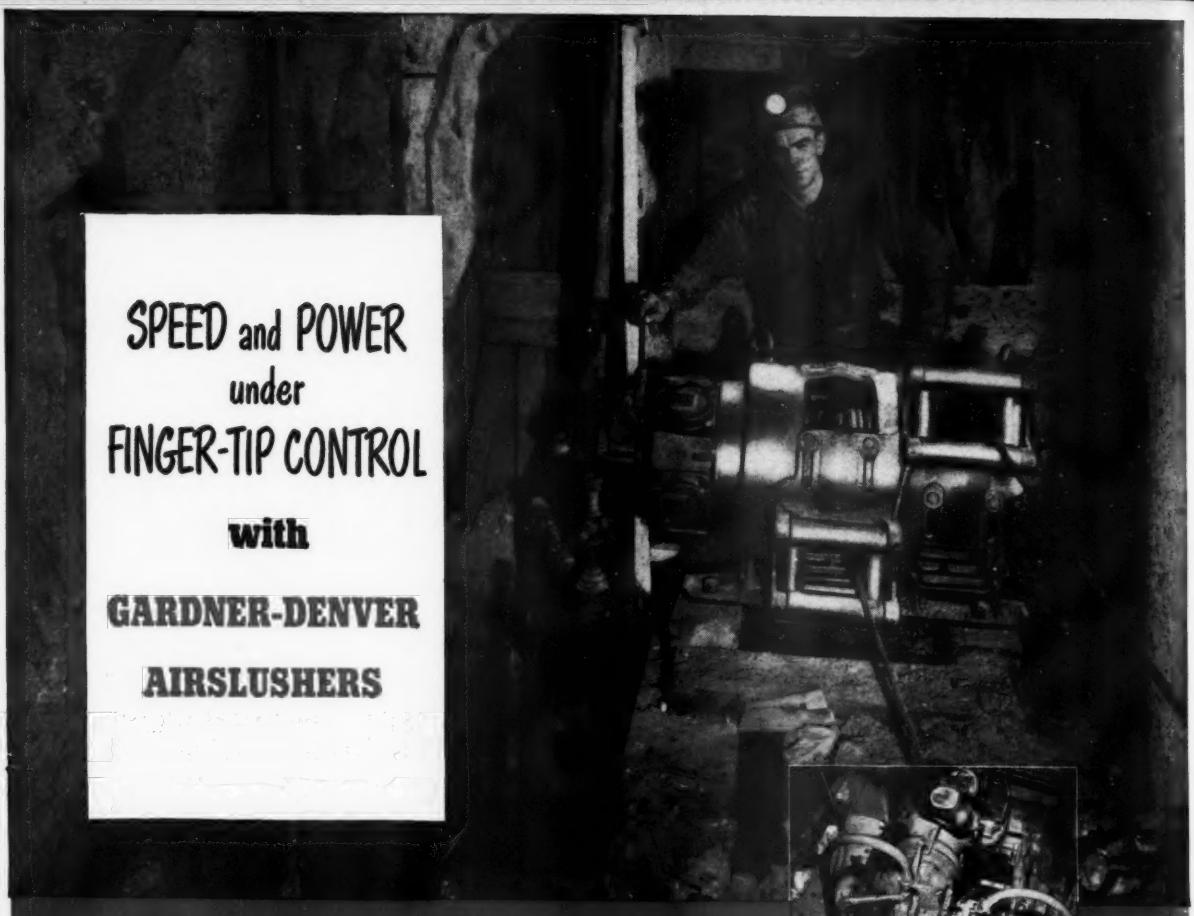
▲ West Kentucky Coal Company, Madisonville, Kentucky, cuts costs in their East Diamond Mine with this mobile cutting machine using Bowdil 9-ft. Cutter Bar, Bowdil Chain and new 1-29 Bowdil Bits.

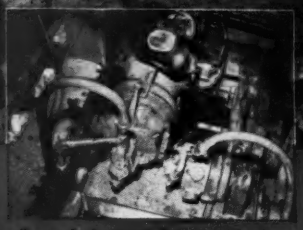
PHOTO BY WM. VANDIVERT FOR WEST KENTUCKY COAL COMPANY IN COOPERATION WITH BITUMINOUS COAL INSTITUTE.

The BOWDIL Company
CANTON, OHIO

* ORIGINATORS OF THROW-AWAY BITS; MANUFACTURERS OF BARS, BITS, CHAINS AND OTHER PRODUCTS FOR COAL MINING; CUSTOM MACHINERY DESIGNERS AND BUILDERS; HEAT TREAT SPECIALISTS; SALES AGENTS FOR THE CINCINNATI ELECTRIC DRILL.

SPEED and POWER under FINGER-TIP CONTROL with GARDNER-DENVER AIRSLUSHERS





Speed shaft sinking with the Double Drum HMS Shaft Mucker.

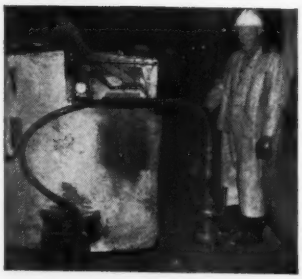
other GARDNER-DENVER ways to reduce mining costs:

Put tugging power where you want it, with compact Air Hoists.

Shape drill steel on the fast-acting DS6 Sharpener.

Protect rock drills with the L012 Automatic Line Oiler.

Handle water with the pneumatic pump that keeps grit out of the seal and bearing —the VP4.



Write for Bulletins describing Gardner-Denver Mining Equipment.

GARDNER-DENVER SINCE 1859

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd.

14 Curity Avenue, Toronto 13, Ontario

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

Steel rail sets are cheaper and outlast timbers

Steel Rail Sets at Resurrection

Require 25 Percent Less Time to Install, Last Longer And Initial Cost Is Less

By WM. R. DOYLE
Newmont Exploration Ltd.
Montrose, Colo.

BECAUSE of the successful use for a number of years of steel rail sets in Newmont's Grass Valley operation, the decision was made to adopt steel rail sets for Resurrection. Although steel rail sets are in common use throughout the mining industry and various companies use arched and curved structural steel sets in tunnels, very few use arched sets made of scrap rail. The purpose of this paper is to present the advantage of arched sets and the economy of fabricating for use in a small mine.

Due to amount of timber used at Resurrection Mine in Leadville, Colo., it was decided in 1948 to investigate possibilities of steel sets, especially for the Yak Tunnel, most of which was driven prior to 1900. It is 19,000 ft long and roughly half this distance is timbered with over 2000 timber sets. Due to ventilation and acid water, the life of some wood sets is less than four years. With these conditions timber repair is quite an item.

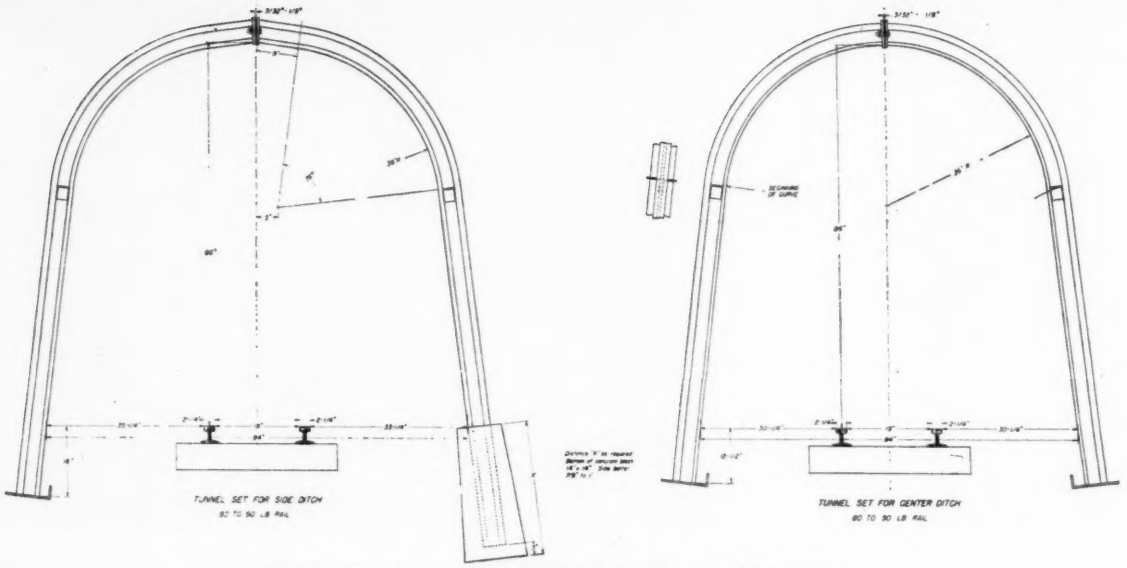
After investigating various kinds of steel sets, two-piece arched sets were adopted for our mine. Our requirements were such that we could afford to install necessary shop and equipment to manufacture them in quantities.

One reason for adopting this style set was that steel rail is generally available. We could use our own scrap rail. Railroads are another source of supply. With steel shortages and regulations, it would be rather hard to buy this amount of new materials. One of the objections to steel rails is tendency of second-hand rails to break. Crystallization or fatigue is quite common and failures occur especially at holes.

Heating Relieves Stresses

In order to bend rails they must be heated. This heating allows us to use scrap rail, which is generally quite brittle and could not be used unless heated. Scrap rail is considerably cheaper than relay rails. Our policy is to pay about five dollars a ton above steel mill prices for scrap.

Rails are heated to cherry-red in furnace



Steel sets from scrap rail provide inexpensive tunnel and drift support

As materials account for 75 percent of the total cost, the price of the rails used is quite important.

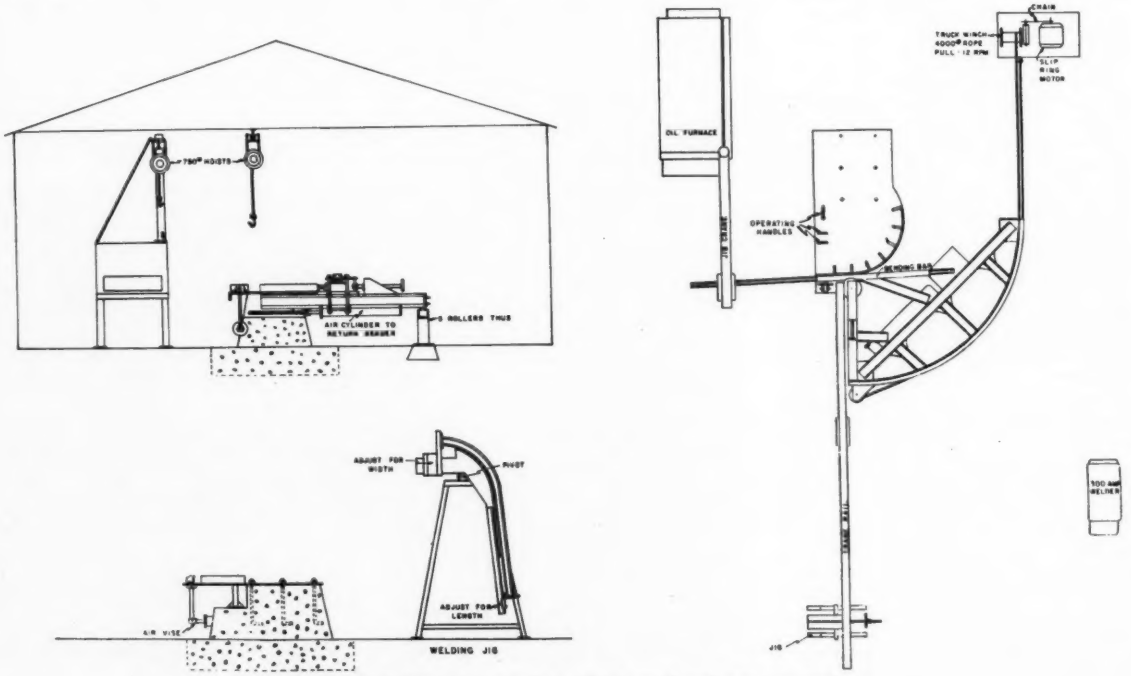
Other reasons favorable to arched steel sets are: (1) They are stronger. (2) Less material is required for each set. (3) They are easier to install. (4) In the case of new work the back is left arched and it is not necessary to blast out for posts and less rock is excavated. This is quite important when waste must be hauled and hoisted.

Sets have been standardized from the start. This allows quantity production and reduced costs. They are stored in the timber yard and ordered as needed just like timber.

Where sets are exposed to acid water they are painted with acid resisting paint and a concrete block is precast on the leg that goes on the ditch side. The acid water attacks the concrete to some extent but is not too serious a problem.

To date there are about 700 steel rail sets in the Yak Tunnel and probably that many more in the mine. Rails used weigh from 20 to 90 lb per yd. Sets are placed on five-ft centers and the rail weight is varied to suit the ground. Some three piece sets are still used for special conditions. Many sets have been in for more than four years and failures are very uncommon.

Sets were designed to eliminate waste. Pieces of rail ten and eleven ft long are used. This length cuts



A pre-fab building houses shop where steel rail sets are made

without waste from most rails. Odd lengths of rail make waste and add considerably to cost.

Plant and Equipment

A prefabricated steel building 30 by 40 ft is used as shop. Equipment consists of furnace, bender, electric welder, jigs, cranes, etc. Entire shop is serviced by electric cranes.

The oil furnace has three burners. It holds from 10 to 20 rails. Starting from a cold furnace, rails are heated and ready to bend in 30 min. Thereafter furnaces can heat rails faster than they can be bent. About eight ft of rail is heated to a cherry red. Furnace is kept full of rails at all times.

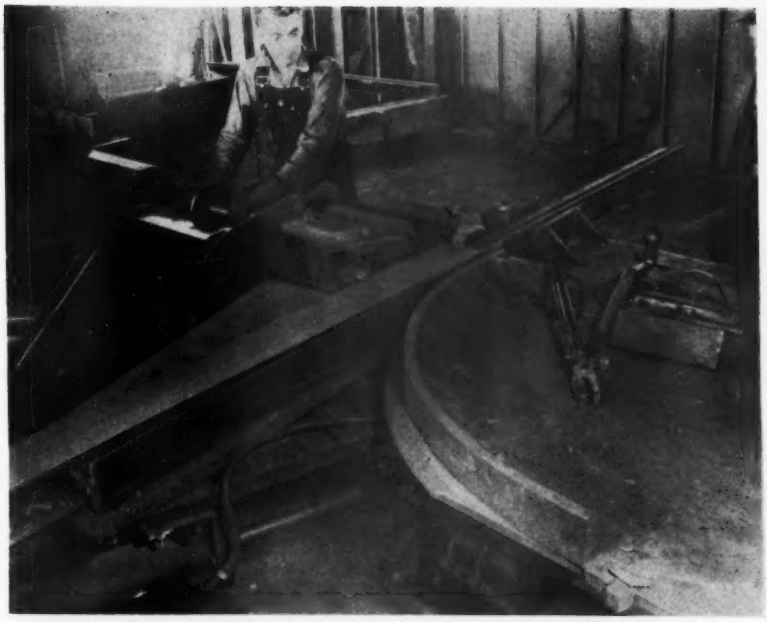
The bender consists of a steel plate, form, and a rotating boom. The one-in. plate is mounted on a concrete foundation. The form is made of 1 by 4-in. steel and is welded to one-in. plate. This form is bent to a 30-in. radius. The revolving boom rotates around the form. Both are laid out from a common center. Outside of boom is used as a rope-seat. This seat has a nine-ft radius. The two radial legs of the boom are approximately 90° apart. An adjustable roller is mounted on one leg. The outside rim or rope-seat is supported from floor on rollers. Boom is rotated by a truck winch and cable. This winch is powered by a slip ring motor. One end of cable is dead-ended to foundation. Other end is attached to winch drum. Cable passes through snatch block on far end of boom. This outer edge or rope-seat is set off-center so that cable winds evenly on drum. The drum is about six-in. diameter and revolves at 12 R.P.M. Horsepower required varies with size rails, etc. We use 410 hp motor to drive winch. To bend a rail the boom revolves about 90°. After the bend is made, an air cylinder returns the boom to its starting position. All control handles, valves, etc., are located together on the one-in. base plate.

An air vise holds rails during bending. This vise with vee-blocks is also used in bending base plates.

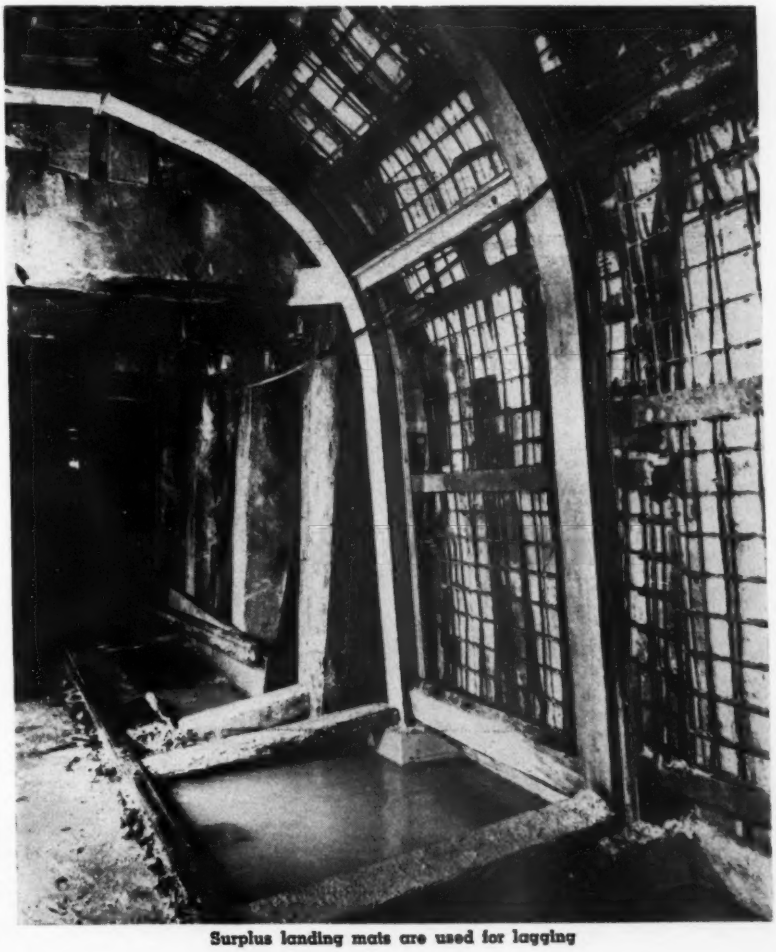
Overcome Collapsing Webs

At the start some trouble was encountered when bending old rails with a thin web. When the roller was placed directly on the ball of the rail the web collapsed during bending. To overcome this a bending bar was made in the form of a channel. The legs of this channel extend down to the base of the rail. The web or back side of channel is made of two by four mild steel and outside of this a piece is machined to fit the flanged bending roller. This bar is made to fit the largest section of rail. It is shimmed up when necessary to fit smaller sections.

In operation the heated rail is



Heated rails are bent around homemade form designed and built at Resurrection



Surplus landing mats are used for lagging

After cooling on horses, flanges are welded on and holes made

Welding-jig is adjustable

placed inside the bar and the roller placed against the bar. Both ends of the bar are free. As the rail is bent it leaves the bar. This has eliminated the trouble and now the bending-bar is used for all rails. It helps keep rails straight at all times.

After the rails have been bent they are piled on horses and allowed to air cool. A template is used to trim them to proper length and shape. This template is adjustable and flanges guide the cutting torch. No measuring or marking is necessary.

Rails are then placed on a jig and flanges. Bases and collar brace angles are welded in position. This jig also acts as a positioner and is rotated so all welding is done in the down position. It maintains a standard batter. The jig is adjustable for width and height. All sets made from the same set-up are interchangeable without measuring or marking.

Only Two Men Needed

Two men operate the shop. Usual practice is to heat and bend rails in the morning and then finish them in the afternoon. Some loss occurs by not using furnace all day after it is heated up, but this loss is overcome by better production. In planning this operation, the type and kind of work was taken into consideration. If work was too hard or heat too great, production would drop toward end of day. This applies especially in Leadville, which is 10,300 ft above sea level. By splitting up the day, better production is obtained. One man welds and the other trims and cuts rails, and has time to make parts for sets. Special rods are used to insure sound welds. At present Lincoln 77 rods are used.

Set Installation Simple

First step in installing a set is to place one leg and attach the collar brace. This piece is then positioned in proper relation to the track. A plumb bob is hung from the center joint plate which is moved until it is in the center of set. The other half is then bolted in position. If the center joint has been properly centered, the legs will be of equal length. After the set is in place, rails or old pipe are laid on top of sets. The space between the rails is covered with matting or wood lagging and the set is blocked tight. The spacing and weight of crosspieces depends on the ground. The less wood used the better. Short rails or slab rock is sometimes used for blocking and the lagging or matting is sometimes placed on top of crossrails, but generally it is laced between them.

The matting used is war surplus wire landing mat from the air fields. It comes in sheets 3 ft by 12 ft. Side bars are made of ¼ by one-in. mild steel. Crossbars are ⅜-in. round mild steel, sheared to size. Some mat-

(Continued on page 65)

TO HELP SELL COAL...

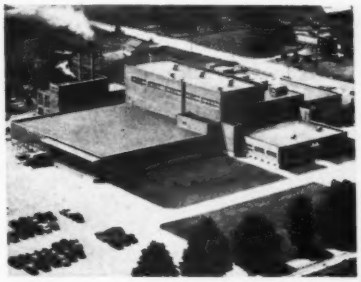
BCI Advertises to the Industrial, Commercial and Institutional Markets.

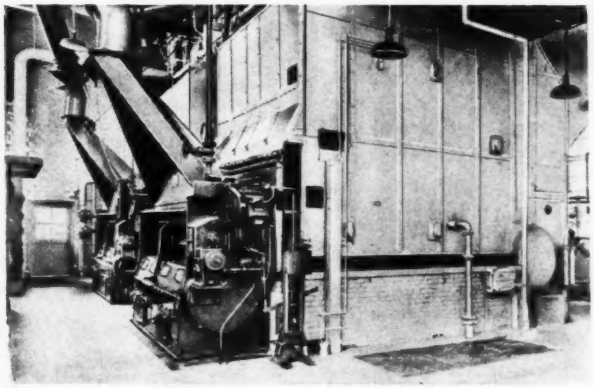
Each month, full-page messages like the one shown below—featuring either "off-track" or "on-track" installations—appear in the pages of *Business Week*, *Nation's Business* and a carefully selected group of power journals and trade magazines.

"COAL'S BEST FOR OUR MODERN PLANT!

It's low in cost... It's clean and convenient!"

says G. W. Peters, Engineering Manager
M&R DIETETIC LABORATORIES, INC.
makers of PREAM & SIMILAC





"We made a careful study of fuels and burning equipment before building our modern new plant in Sturgis, Michigan. This plant was designed to produce baby food. So the steam plant has to be clean and dust-free as well as economical to operate. Also, we wanted a fuel we could store safely and easily in order to insure ourselves against any shortages.

"We decided on bituminous coal—and the up-to-date installation shown here. It certainly fills the bill on every count. Our modern combustion equipment makes coal far more economical than any other fuel. Up-to-date coal and ash handling give us convenient operation completely free of dust nuisance."

Additional case histories, showing how other types of plants have saved money by burning coal the modern way, are available upon request.

Discover for yourself the great advantages of coal burned the modern way. Call in a consulting engineer. He'll show you how today's combustion equipment can give you 10% to 40% more power from a ton of bituminous coal than from equipment used only a few years ago. He'll show you how modern labor-saving coal and ash-handling equipment make a coal-fired installation clean, convenient, and dust-free.

If you plan to remodel or build a new plant, be sure to look into the low cost and convenience of bituminous coal. Consider coal's other advantages, too. It has reserves that are virtually inexhaustible. America's bituminous coal mining industry is the most efficient and productive in the world. With bituminous coal, you can be sure of plenty of fuel at relatively stable prices now and for years to come.

If you operate a steam plant, you can't afford to ignore these facts!

BITUMINOUS COAL in most places is today's lowest-cost fuel, and coal reserves in America are adequate for hundreds of years to come.

COAL production in the U.S.A. is highly mechanized and by far the most efficient in the world.

COAL prices will therefore remain the most stable of all fuels.

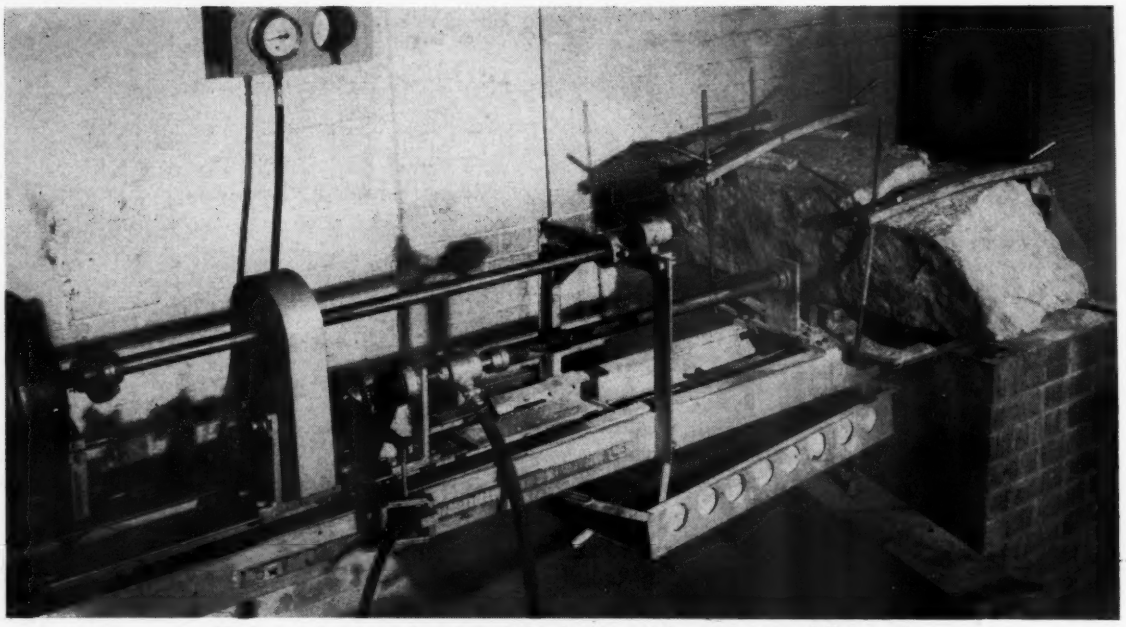
COAL is the safest fuel to store and use.

COAL is the fuel that industry counts on more and more—for with modern combustion and handling equipment, the inherent advantages of well-prepared coal net even bigger savings.

BITUMINOUS COAL INSTITUTE
A Department of National Coal Association
Southern Building, Washington 5, D. C.

FOR HIGH EFFICIENCY FOR LOW COST

YOU CAN COUNT ON COAL!



Much work has been done toward developing a high speed rotary drill for rock

Science and Coal

By E. ROSE

Until Recently an Official of Britain's National Coal Board

BEFORE nationalization, Britain's mining industry had little in the way of a scientific service. Since 1946, the National Coal Board has set itself the task of building up a comprehensive service in the interests of greater output, economy of coal, and the welfare and safety of the miners.

In 1948, the N. C. B. opened their first research center at Stoke Orchard, in Gloucestershire. So great has been the pressure of work that another center at Isleworth, on the outskirts of London, was opened last year.

The new center is undertaking research into underground mining problems and mechanical and electrical engineering, insofar as they affect the mining industry. Stoke Orchard concentrates on research into the treatment and processing of coal and related chemical engineering problems.

Dust Control

One of the big underground problems upon which the scientists have been engaged has been the effective organization of routine dust control and measurement. The importance of this work is underlined by the heavy, although declining, incidence of pneumoconiosis amongst miners. During 1952 over 3000 miners were certified as having the disease, or 6.1 per 1000 underground workers.

The task of measuring dust concentrations so that an accurate picture is obtained of conditions at the coal-face, or anywhere else where men may work, is enormous. It involves taking a very large number of small dust samples. Last year over 1,100,000 samples were taken with a rapid, routine instrument and 37,000 with the more accurate thermal precipitator.

The development of a long-running thermal precipitator by Coal Board scientists which will provide a running commentary on dust concentrations is likely to meet an urgent need. The new instrument is so designed that the larger particles of dust settle out before reaching the "thermal deposition" zone, so that they do not obscure the important small particles.

But dust measurement is no substitute for dust control, and the best way of suppressing dust is not to make it. Work has been concentrated on designing a machine which cuts efficiently yet creates the least amount of dangerous dust or other fines. An experimental percussive coal plow has been built in which a percussive force can be imparted to the plow blade by pneumatic means. When the haulage force required to draw the blade through the coal rises, the supply of compressed air to the percussive mechanism is automatically increased, and

Roof control studies have been aided by the use of the Romometer to measure direction and relative movements of mine roof and floor

with it the frequency of percussion. When the hard coal has been broken by the percussive action, the haulage speed returns again to normal. The rate of cutting is very fast. An improved model of the plow is now being built.

Another problem with which the research establishments have been concerned is that of high speed rotary drilling in rock. The conditions necessary for efficient rotary drilling in stone have been shown to be adequate thrust, short cutting edges to concentrate the thrust, a moderate speed of rotation to reduce wear on the cutting edges, a central gap, and a sufficiently large smooth clearance angle behind the tips to ensure adequate clearance of debris.

To meet these requirements, a hollow bit has been developed for use with a hollow drill rod which is flushed with water in such a way that the drillings are removed from the hole by passing down the *inside* of the rod. It has been shown in the laboratory that with this design of drill it is possible, with moderate thrusts, to drill at a rate of six fpm in medium sandstone.

An improved drilling machine in which the drill rod is fed continuously through the machine and which first clamps itself into a pilot hole in the rock face has been designed and is under test.

Radioactive Tests

As an aid to determining the most suitable grades of tungsten carbide for particular types of duty, experiments have been carried out on the measurement of drill bit wear by radioactive techniques. Experimental drill bits were irradiated in the atomic pile at Harwell, and the wear of the bits estimated by measuring the radioactivity of the drillings.

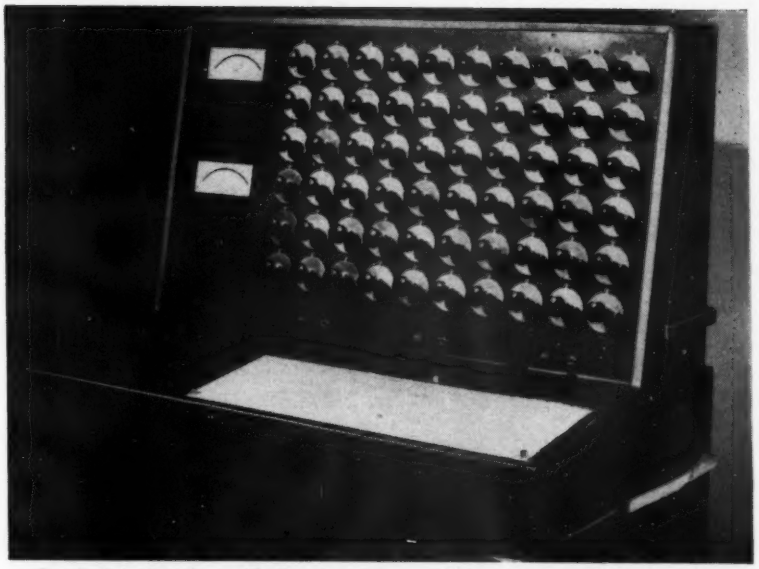
One major piece of research which is now on its last lap is that on fireproof conveyor belting. It has been found that a belt in which polyvinyl chloride replaces the rubber in the covers and between the plies is noninflammable in all circumstances. When heated, the PVC melts and impregnates the duck, automatically making it fireproof. The tensile strength is unimpaired and the expense of fireproofing the duck is avoided. Commercial PVC suitable for belting is a rubber-like plastic, incorporating various chemicals as plasticizers, stabilizers, fillers, and so on.

Many types of PVC conveyor belts have been manufactured, and full-scale trials have shown that some do not stand up to underground conditions. Manufacturers and scientists are cooperating in remedying the defects, and it is hoped that before long PVC belting in the pits will have removed one cause of underground fires.

During the last 20 years, many attempts have been made to test winding and haulage ropes by magnetic or electronic means, but so far with only limited success. At present, ropes are replaced after a definite period, even though some may still be serviceable. The N. C. B. scientists are studying an electro-magnetic method in which the rope is made to serve as the central core of a pair of induction coils. When an alternating current is passed through the coils, the signals obtained show characteristic changes if a strand is broken. As the changes are caused by alterations in cross-sections of the core, it may also be possible to detect "necking" by this method. It is possible now to detect single wire breaks in a 42 strand rope.

Space does not permit more than a passing reference to other scientific achievements. The ventilation network calculator was developed in the first place at Nottingham University under Coal Board sponsorship. Trials have shown that the calculator can solve with great rapidity ventilation problems that have hitherto required lengthy mathematical analysis. A commercial instrument is shortly to be put on the market. A new roof movement meter, the romometer, has also been developed, indicating the direction of relative movements between roof and floor in mines.

This article has only dealt with some of the achievements of Britain's research on underground problems. What has been achieved "above the shaft" is another story.



A calculator has been developed to solve rapidly complex ventilation problems

"But that's not what I meant when I asked you to have them send over a new drill team!"

With diamonds oriented, core bits are carefully cast

Taking Advantage of Hard Vector Direction of Diamonds Sends Feet Drilled Per Bit Way Up And Diamond Loss Way Down

More About Oriented Diamond Bits Cutting Drilling Costs

By WING G. AGNEW
Chief, Mining Research Branch
Region VIII, U. S. Bureau of Mines
and
W. H. HAMPTON
Secretary
Hoffman Brothers Drilling Co.

IN the August issue of MINING CONGRESS JOURNAL there appeared an article, "Oriented Diamond Bits Cut Drilling Costs," by Adrian E. Ross and Albert E. Long, which described some of the background history of oriented diamond bits and gave the results obtained by a diamond-bit manufacturer when its contract drilling department field-tested oriented diamond bits. The present paper deals with the experience of yet another bit manufacturer, Hoffman Brothers Drilling Co., of Punxsutawney, Pa., and gives some of the results obtained by its contract drilling department through the use of oriented diamond bits.

In the fall of 1952 officials of Hoffman Brothers Drilling Co. read a Bureau of Mines publication* and immediately began experimenting with the orientation of diamonds in bits. By the first of January 1953 the firm had become convinced of the value of the oriented type of diamond bit, and, consequently, since that date it has manufactured only bits with the diamonds oriented in hard-vector directions.

All the diamond bits used in its field tests were manufactured by Hoffman Brothers Drilling Co. by the cast-set method. The data presented in the following tables are for NX-size bits with beryllium-nickel matrices set with diamonds of 6- to 10-per-carat size and of a medium grade described by some manufacturers as AA grade. The tables present the results of field tests on three different contracts located geographically in different States. The diamond drillers in the field were not told about the oriented bits, and, consequently, after using them some of the drillers' comments are quite revealing.

On this job driller A said, "Don't know what you've done, but my footage has increased per eight hours with less effort"; while driller B wrote, "Why don't you give me bits like you give [driller A]? My bits just don't cut like the other ones."

When asked for comments regarding the bits he had been receiving, driller C said, "I'm having to change bits less often and getting more footage out of a bit"; and driller D wrote to the office the following pertinent comment: "You're always talking about more footage—then why not give me bits like you're giving [driller C]?"

Driller E commented on the oriented bits in the following manner: "The bits cut faster, and when the penetration slows down you might as well

* Long, Albert E., and Slawson, C. B., Diamond Orientation in Diamond Bits. A Method of Identifying Hard Vectors for Setting Purposes: Bureau of Mines Report of Investigations 4853, February 1952, 6 pp., 11 figs., XI plates.

Setter must pass a rigorous training course in diamond crystal structure

A magnifying glass helps diamond setter identify hard vector surfaces

take off the bit. It certainly shines when penetration slows down—acts to me a lot like the old carbon bracelet bits. I like them." Driller F's comments were as follows: "Went over to [driller E's] drill and ran it for eight hours. He took my drill. There certainly is a difference in bits. Send me a box right away."

All three of the diamond drilling jobs for which comparative results have been presented had one thing in common: the drilling was done in coal formations and, hence, in sedimentary rocks in which large-stone bits were the most suitable.

It is true that bits set with the diamonds oriented in hard-vector directions actually require more time to set, and therefore a slight increase in setting charge is made by the manufacturer. However, in the above table the savings greatly offset the additional setting charges. The additional setting charges are based on the size of the diamonds and are grouped according to the size per carat, such as 6-12, 13-18, 19-24, 25-33, 34-40, the charges increasing as the stones diminish in size.

Orienting diamonds in hard-vector directions in bit crowns has resulted in a considerable reduction in the amount of diamond material discarded as scrap. This is due to the fact that the majority of fractured or undersize diamonds which formerly were considered unfit for reuse in a random-set bit will perform quite satisfactorily when reset in hard-vector directions in bit crowns.

The diamond bit in which the stones are oriented in the hard-vector directions no longer can be ignored if one is interested in conservation of diamonds and reduced cost per foot. The saving is more apparent when bit costs are kept on a cost-per-foot basis.

Since the field tests were conducted, all diamond bits used by the contract drilling department of Hoffman Brothers Drilling Co. have had the diamonds oriented in hard-vector directions. A constant check is made between the results now obtained with oriented bits against last year's records when only random-set bits were used, and the diamond losses are consistently running less than indicated in the field tests.

TABLE I—NX BITS DRILLED IN SEDIMENTARY ROCK, PRIMARILY A SHALE AND CONGLOMERATE SANDSTONE-COAL FORMATION

	Oriented	Random-set
Driller	A	B
Number of bits	26	23
Footage	2,744	1,120
Diamond loss (total carats)	51.05	74.30
Diamond loss per foot, carats	0.01860	0.06634
Diamond loss per bit, carats	1.96	3.23
Average footage per bit	105.5	48.7

TABLE II—NX BITS DRILLED IN A BROKEN LIMESTONE FORMATION

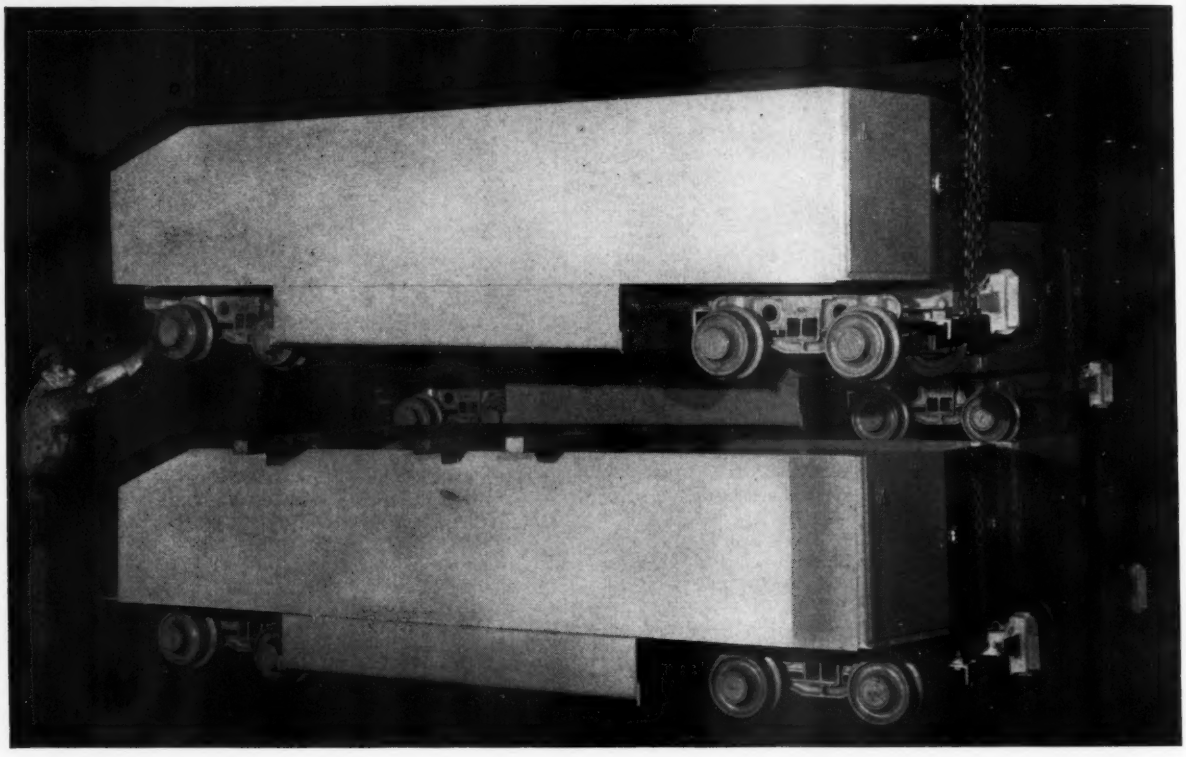
	Oriented	Random-set
Driller	C	D
Number of bits	11	19
Footage	3,113	3,876
Diamond loss (total carats)	11.44	37.24
Diamond loss per foot, carats	0.00367	0.00961
Diamond loss per bit, carats	1.04	1.96
Average footage per bit	283.0	204.0

TABLE III—NX BITS USED IN STRIP-DRILLING COAL

	Oriented	Random-set
Driller	E	F
Number of bits	3	4
Footage	1,836	2,344
Diamond loss (total carats)	3.09	7.24
Diamond loss per foot, carats	0.00168	0.00309
Diamond loss per bit, carats	1.03	1.81
Average footage per bit	612.0	586.0

TABLE IV—SUMMARY OF TABLES I, II, AND III

	Oriented	Random-set
Number of bits	40	46
Footage	7,693	7,340
Diamond loss (total carats)	65.58	118.78
Diamond loss per foot, carats	0.00852	0.01618
Diamond loss per bit, carats	1.64	2.58
Average footage per bit	192.3	159.6



A Fleet of These Will Haul a Lot of Coal

These shiny, brand-new Bethlehem cars are part of a fleet for a high-production bituminous mine. It's a fleet that will haul a lot of coal, for the cars are of high capacity—10 tons each. What's more, they are built to last for many years.

The all-steel, all-welded bodies are brutes for punishment. Ten-ton loads won't bother them. The running-gear is sturdy, too—eight forged wheels per car, and cast-steel trucks with extra-heavy springs.

This model is but one of the many in Bethlehem's large family of mine cars. Whatever suits your own particular needs, Bethlehem will build for you—eight-wheelers, four-wheelers, end-dump, rotary-dump, high-side, low-side. The various models differ greatly in size and style, but they all have one common point—they are made for the most severe pounding you can give them.

Call or write us the next time you're considering additions to your fleet. Our engineers will gladly help you design your cars, and our shops will build them to specifications—durable cars that will serve you well.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

BETHLEHEM STEEL

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Wheels of GOVERNMENT

AMC

As Viewed by HARRY L. MOFFETT of the American Mining Congress

WITH Congress adjourned and its members engaged in numerous investigations or in mending fences at home, the administrative departments of Government have had a breathing spell in which to round out organization, get caught up on accumulated backlogs of work, and prepare legislative recommendations for the next session.

Latest word from Administration spokesmen indicates that there is not likely to be a special session of Congress this fall. In the last few days before adjournment there were numerous rumors that the legislators would be called upon to return to Washington to consider a hike in the national debt limit but Treasury officials now state that this will not be necessary. The President, in a recent news conference, substantiated these statements when he said that a special session will not be needed since it appears that the Government will be able to get through next January without exceeding the debt limit.

President Eisenhower made his first Supreme Court appointment when he named Governor Earl Warren the 14th Chief Justice, succeeding the late Fred Vinson. Warren assumed the post with the opening of the Court's fall term and with a number of major issues facing the Nation's top legal body.

Two important Government Commissions are commencing studies which may have far-reaching effect upon Federal Government activities. A 25-member Intergovernmental Relations Commission, headed by Clarence E. Manion of Notre Dame University, is investigating all of the present activities in which Federal aid is extended to State and local governments, the interrelationships of the financing of this aid, and the sources of the financing of governmental programs. It is charged by a recently enacted law with making recommendations to the President for legislative action to remove inequities in aid and tax programs of the various levels of government. The other Commission, headed for the second time by former President Herbert Hoover, the Government Reorganization Commission, has created a number of "task groups" which will look into several major matters and come up with reports for the Commission in the near future. Among the subjects assigned to a task group was that of studying water and power resources.

The U. S. Bureau of Mines will continue under the direction of its present Director, John J. Forbes, for the next two years, thus ending the Administration's quest for a successor.

Tax Outlook Cloudy

The Administration has finally come up with a flat declaration that the excess profits tax will be permitted to expire on December 31, and that no request will be made for its renewal. Also, the Administration has made it clear that individual income tax reductions, averaging about 10 percent, scheduled to go into effect on the same date, will do so. Budgetary difficulties had created much speculation to the effect that the Administration would seek continuation of these taxes.

The atmosphere is not quite so clear as to what the Administration will seek in the way of additional revenue to offset the drop in income resulting from the expiration of these two revenue sources. While the President and his fiscal aids have made it clear that they will not urge the imposition of a retail sales tax, there have been statements that a sales tax might be sought at the manufacturers' level. This latter proposal has met with strong opposition from members of Congress and from industry.

Meanwhile, Representative Richard Simpson (Rep., Pa.), third-ranking member of the House Ways and Means Committee, has indicated that Congress may compromise on a four percent decrease in corporate income taxes, instead of the automatic 10 percent decrease scheduled to go into effect April 1, 1954. He has declared that this move might provide enough revenue to balance the budget if Congress also enacts a broader and more uniform system of excise taxes.

★ ★ ★ ★ ★ ★ ★

Washington Highlights

TAXES: Some cuts sure.

T-H REVISION: Up to Congress?

TARIFF: Trade changes studied.

STOCKPILING: Acquisitions slowed.

RESOURCES CONFERENCE: Mineral Committee named.

★ ★ ★ ★ ★ ★ ★

Elsewhere in the tax field, Defense Mobilizer Arthur Flemming has announced that rapid tax-amortization certificates granted by the Government to defense-producing companies will be curtailed for many industries. Reason given is that a large percentage of the expansion goals have been met. Decision as to which industries will fall within the curtailment program has not yet been made.

Will T-H Be Revised?

What changes, if any, that will come out of the next session of Congress remain in doubt. It may be that the White House will leave the labor law revision question squarely in the hands of Congress and not make any recommendations, or it may take another look at the proposals made by the Labor Department which have created such a storm of protest both within and without the Administration.

Labor law revision came to a head as a result of the resignation of Martin Durkin as Secretary of Labor. He resigned in a huff because he said the White House did not live up to an agreement with him to adopt his proposals for revising the labor law. These proposals, which for the most part would weaken the present law and make it more palatable to labor, "leaked" out of the White House just prior to the adjournment of Congress. The President has since denied that he had failed to live up to any agreement. Several members of the Cabi-

net had joined forces to block Durkin's efforts to rewrite the law.

Some of the controversial proposals advanced by Durkin have gained the support of House Labor Committee Chairman McConnell (Rep., Pa.). In a recent speech at Princeton University, McConnell said that the law needed some revision and that he was in agreement with twelve of the nineteen proposals advanced in the "working draft" which came out of the White House. It is highly doubtful that the full House Labor Committee would go along with any large number of these proposed changes.

The proposals which McConnell indicated he was in general agreement with would (1) provide that the common law rules of agency be applicable to both labor and management; (2) permit a union to expel a member and require an employer to discharge him for (a) disclosure of confidential information of the union, or (b) reasonable cause to believe a member is a Communist; (3) permit an employer to notify a union that jobs exist and give the union opportunity to refer qualified applicants; (4) permit employers, if they desired, to enter into pre-hire contracts with unions in certain industries, and to require new employes to join the union within seven days; (5) clarify the definition of "supervisor" but retain the language of the present Act so as to exempt the true supervisor; (6) provide that the notice of intent to modify or terminate an agreement be reduced from 60 to 30 days, and to eliminate penalty of loss of status of individuals who strike during the notice period; (7) eliminate the requirement that unions file any information other than their constitutions and by-laws, the names and compensation of their officers and agents, the manner in which officers and agents are selected, and initiation fees and dues charged; (8) eliminate the requirement that the NLRB must seek injunctions whenever it has reasonable cause to believe that injury will result from a prohibited secondary boycott, and provide that such practices be subject to discretionary injunctions; (9) provide that authorization for deduction of the employe's dues be valid until revoked by the employe; (10) eliminate the requirement that the employer must participate in the administration of union welfare funds; (11) prohibit the holding of a representation election for a period of four months after the commencement of an economic strike, in order to protect employes on strike; and (12) provide that neither party to a contract could force bargaining on "new issues" during the term of a labor contract.

McConnell said that he intended to give further study to clarifying proposals on secondary boycotts, "bearing in mind that the secondary boycott ban is to be used to protect innocent third parties and for no other purposes." He strongly opposed the recommendation that would grant paramount authority to the Federal Government in the field of labor law.

He pointed out that "honest" differences of opinion exist on the other proposals and stated that each item must receive further study.

Foreign Trade Changes Under Study

The Foreign Economic Policy Commission, which was created by the revised Reciprocal Trade Agreements Act, has jumped into the task of studying U. S. tariff policies and readying a report for the President and Congress.

President Eisenhower has asked the Commission to give "earnest attention" to a report from Lewis Douglas, former Ambassador to Great Britain, which sharply criticized U. S. foreign policy as a barrier to international economic stability. The report, which is highly controversial, did not receive the President's endorsement. It calls for the removal of tariff barriers and a more unfettered exchange of currencies. It also said that, pending the adoption of freer trade legislation, the United States should announce that it plans to simplify our customs practices and to relax our "restrictive foreign trade legislation."

Meanwhile, the National Lead and Zinc Committee has asked the Committee for Reciprocity Information to withdraw, on December 31, 1953, the reductions in the lead and zinc duties made under various trade pacts. The Committee said that they have caused serious injury to domestic lead and zinc mining industries and urged that the attention of U. S. negotiators at Geneva be apprised of the investigations and the escape clause action pending with the U. S. Tariff Commission. The Commission will hold hearings early in November on the industry's plea for relief.

Stockpiling "Stretched Out"

Curtailment of Government spending has resulted in an order from the Office of Defense Mobilization which slows up the acquisition of most of the commodities now being stockpiled. Some stockpile goals that would have been reached by next June 30 are now scheduled to be attained some time in 1958. ODM said that purchase goals on half of the 76 critical materials being stockpiled have been three-quarters completed.

The ODM order bans the making of any new long-term contracts. It provides that stockpile buyers in no circumstance may contract for deliveries that, after allowing normal lead time, will require more than one year to complete. It also bans purchases where the inventory of a particular item is almost at stockpile goal size. In such cases, purchases are to be postponed until at least July 1.

ODM said aluminum, columbite, and tantalite will continue to be stockpiled; nickel purchases will be restricted; fluorspar and tungsten will not be purchased; the lead and tin goals have been met but zinc will still be taken from GSA.

ODM reported that actual stockpile outlays this year are expected to total $800 million, $112 million less than was expended during the past fiscal year. The value of the stockpile is currently estimated at $8.5 billion.

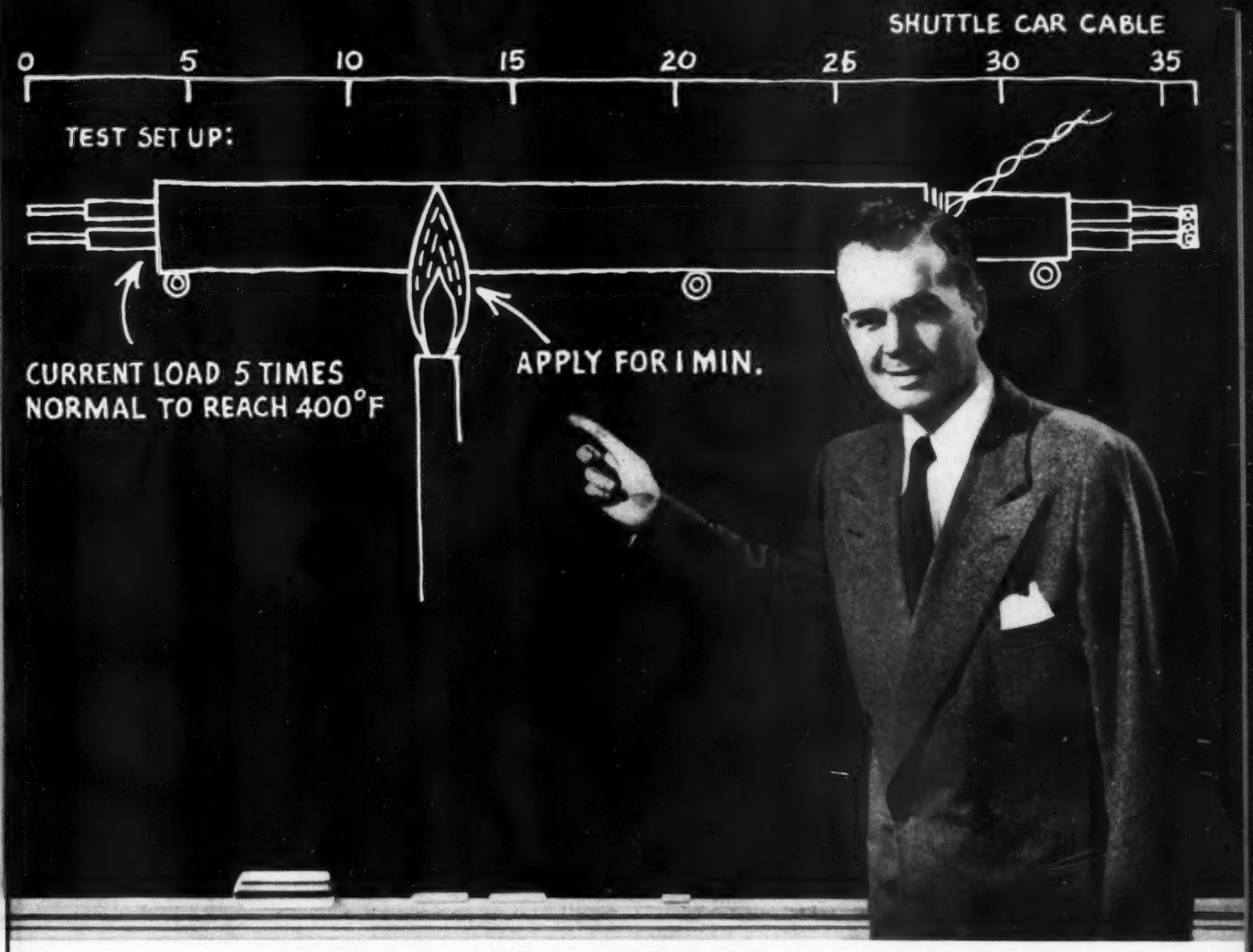
Meanwhile, the stockpiling operations of the General Services Administration are coming under Congressional fire. Senator Bridges (Rep., N. H.) has announced that the Senate Appropriations Committee is studying these operations to determine whether there has been "gross mismanagement" in handling of the stockpile.

The GSA stockpile organization now houses the former DMPA. GSA Administrator Mansure has created a Materials Division to take over the procurement responsibilities for metals and minerals formerly handled by DMPA. Heading this division is Irving Gumbel.

Resources Conference Committees Named

Eight major topics have been scheduled for discussion at the Mid-Century Conference on Resources for the Future in Washington, December 2-4, 1953. These topics include: competing demands for land, utilization of land resources, water resource problems, problems of non-fuel minerals, energy resource problems, world supply and availability of minerals, problems in resources research, and patterns of cooperation. An over-all 16-member Steering Committee to guide the Conference has been named. Included in the membership of this Committee is H. DeWitt Smith, Vice-President, Newmont Mining Corp.

A Steering Committee has also been named to handle the subject of non-fuel minerals. Members of this group are: Evan Just, Vice-President, Cyprus Mines Corp. (Chairman); John W. Vanderwilt, President, Colorado School of Mines; Christopher M. Granger, former Assistant Chief of the U. S. Forest Service; Robert Koenig, President, Cerro de Pasco Corp.; Harold F. Mills, Manager, Iron King Branch, Shattuck Denn Mining Corp.; Donald Montgomery, United Auto Workers; W. M. Peirce, Plant Engineer, New Jersey Zinc Co.; Philip J. Shenon, geologist and director, Day Mines, Inc.; Louis Ware, President, International Minerals and Chemical Corp.; and Howard I. Young, President, American Zinc, Lead and Smelting Co.



APPROVED USBM TEST: Cable fails if it burns more than 6 inches or flames more than 3 minutes.

NO ANACONDA CABLE EVER FAILED THIS TEST

The U.S. Bureau of Mines flame-test for trailing cables is tough. But ANACONDA Cables have passed every time...*with ease*. That's not all! Performance-wise, a recent survey of shuttle cars in 15 mines found ANACONDA Cables last up to 300% longer than cables used only a few years ago.

NEW FEATURES GIVE CABLE STAMINA

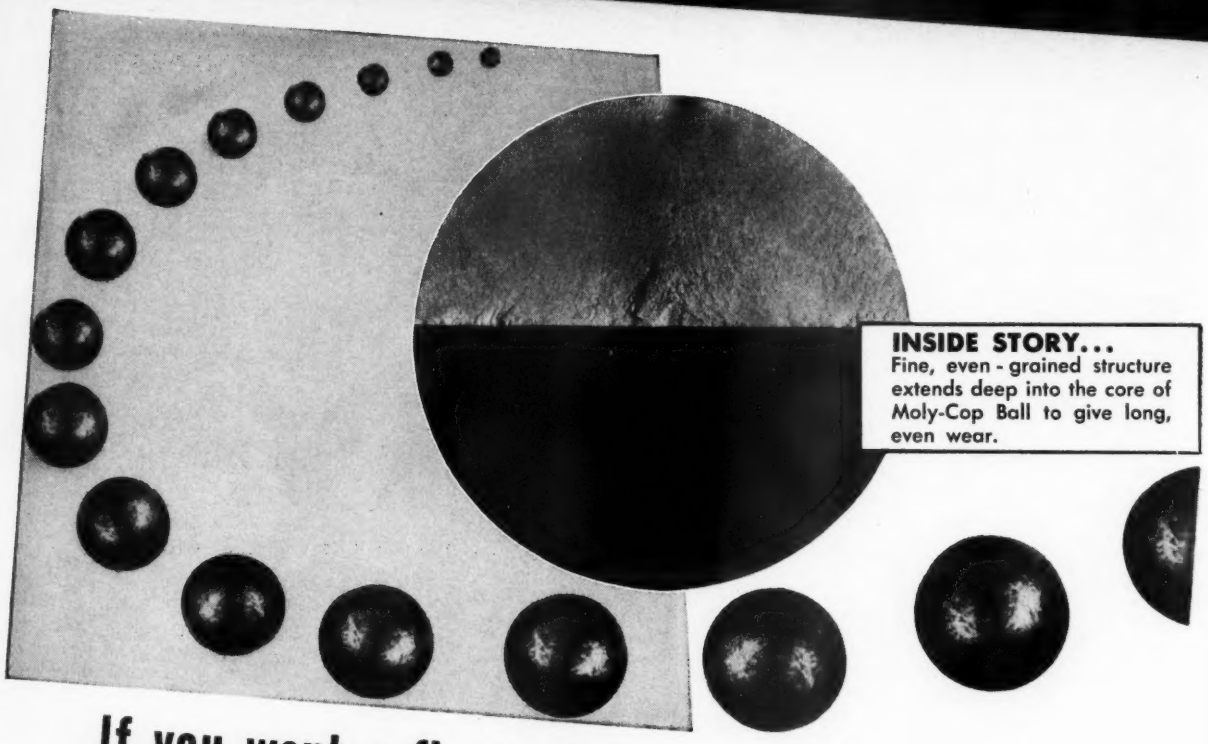
These facts are as good a certificate of quality as any we know. As new features have been added to ANACONDA Shuttle Car Cables, each has been repeatedly tested on special, scientifically designed equipment. A new improved neoprene jacket is tougher, more flame-resistant. You'll find more strength and heat-resistance in the new cold-rubber insulation. The cable has also been stranded in a new and decidedly better way. No wonder it can take more abuse from overloads, compression-cutting, sliver-cuts in wet mines, rib-pinching, runovers and dragging. Patented breaker strip* and balanced tensile strength of ground and power conductors make it safer to use.

A CLOSE LOOK AT CABLE COSTS

Examine this cable yourself. Ask your Anaconda Sales Office or Distributor for a sample. Test it . . . tear it apart. Then look at the cost of *one* shutdown on any working face of your mine caused by *one* break in cheap cable. It far exceeds any possible saving from buying cable on price. Your own production figures soon prove the value of quality cable. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.* *U. S. Patent No. 2,455,773 53303

ANACONDA®

TODAY'S HEADQUARTERS FOR MINE CABLE



INSIDE STORY...
Fine, even-grained structure extends deep into the core of Moly-Cop Ball to give long, even wear.

If you want a finer grind . . . use a finer ball!

SHEFFIELD MOLY-COP

TRADEMARK REG.

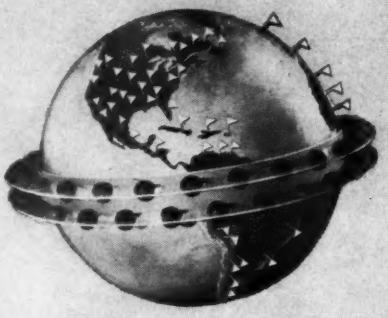
COPPER-MOLYBDENUM-ALLOY

Grinding Balls

For fine grinding you want a ball that will give you the highest possible production rate with the lowest cost per ton of material ground . . . fewer chargings, less "down time."

Sheffield Moly-Cop Balls meet that requirement — because Sheffield's exclusive alloy and automatically controlled manufacturing methods produce a ball of finer, denser, more uniform structure. You get toughness and greatest resistance to abrasion. Moly-Cop Balls wear evenly, retain their spherical shape longer.

Tests have proved that Moly-Cop Balls wear up to 35% longer than alloy cast steel balls; up to 50% longer than best quality unalloyed carbon forged steel; and up to 120% longer than cast white iron balls. Considering initial costs and length of service, the net savings that result from the use of Moly-Cop Balls are substantial.



Used and proved around the world—*Sheffield engineers* are ready to prove the money-saving advantages of Moly-Cop Grinding Balls in your operation. Get in touch with us now.

SHEFFIELD
STEEL CORPORATION
HOUSTON KANSAS CITY
TULSA
SUBSIDIARY OF ARMCO STEEL CORPORATION

Export Representatives: ARMCO INTERNATIONAL CORPORATION, MIDDLETOWN, OHIO

AMC Personals

Alfred R. Flinn, formerly assistant superintendent of the Sterling Mine of the New Jersey Zinc Co. at Ogdensburg, N. J., has been transferred to the New York office as resident mining engineer.

H. I. Altschuler, after many years in South America, most recently as general manager of the Frontino Gold Mines, Ltd., in Colombia, S. A., has returned to the United States and is now living in New York.

George Collamer, formerly superintendent at the Franklin colliery of Lehigh Valley Coal Co., has been transferred to Snow Shoe in Center County, Pa., to supervise the company's bituminous interests in that area. **Richard Miller,** superintendent at Westmoreland colliery, has been appointed superintendent at the Henry operation, succeeding **Herbert C. Kistler,** who has retired. The Westmoreland and Franklin collieries recently suspended operations.

Gov. Dan Thornton has named **Edward D. Dickerman** of Leadville, Colo., and **Dr. W. G. Haldane** of Grand Junction to serve four-year terms on the State Mineral Resources Board of Colorado. **Harrison Cobb** of Boulder; **Art Lorenon** of Silverton; and **William J. Schenler** of Pueblo were reappointed to the Board.

One of the oldtimers at the Philadelphia & Reading Coal & Iron Co., **Harry A. Leidich,** for many years head of the safety department, has retired from active service. P. & R. dedicated its company-wide 1953 First Aid Contest "to his untiring efforts and to a continuation of the work so ably performed."

Brown & Root, Inc., Houston, Texas, engineering and construction firm, has opened a mining and metallurgical division with offices in New York City. **D. Moreno** and **E. H. Monroe** will staff the office. Moreno, a native of Chile, has had wide experience in the mining industry. Among other jobs, he has been chief engineer of the mining department of the American Smelting & Refining Co. and general plant superintendent of Nicaro Nickel Co. in Cuba.

Monroe has also had varied mining experience, over 20 years of which were spent in Canada with such companies as Consolidated M. & S. Co. and Hudson Bay M. & S. Co.

John Griffen, preparation and consulting engineer, McNally-Pittsburg Mfg. Corp., Pittsburgh, Pa., retired October 1, 1953, and will act as a consultant on coal preparation, both anthracite and bituminous. He will be located at 2523 Orlando Drive, Pittsburgh 35, Pa.

Secretary of the Interior Douglas McKay recently announced the resignation of **Dr. Wilburn C. Schroeder** as assistant director for the programming of the Bureau of Mines. Dr. Schroeder will teach chemistry and chemical engineering at the University of Maryland.

George R. Beehler has been promoted to assistant to William W. Everett, vice-president, operations, Glen Alden Coal Co. Beehler was assistant to the manager of mines at the time of his promotion. He has long been active in the field of labor relations and has served on grievance committees for Glen Alden.

Fred D. Vines, assistant chief engineer, The M. A. Hanna Co., Cleveland, Ohio, has been advanced to chief engineer to succeed **Robert S. Walker,** who has been made consulting engineer.

H. M. Tibbs was recently named superintendent of West Virginia division for the Truax-Traer Coal Co. **Max Cassidy** has resigned as general manager of the West Virginia division of Truax-Traer.

Directors of the Sidney Mining Co., Kellogg, Idaho, recently appointed **Malcolm C. Brown** as president of the company. Brown succeeds **W. T. Simons,** who resigned to devote more time to personal affairs and for reasons of health. Other changes in management personnel include **Charles A. McKinley,** from mill superintendent to general superintendent; **C. H. Reynolds,** from chief engineer to mine superintendent.

1954 Coal Convention

EDWARD G. FOX, President, Philadelphia and Reading Coal & Iron Co., has consented to serve as National Chairman of the Program Committee for the American Mining Congress, 1954 Coal Convention. This three-day meeting will be held in Cincinnati, Ohio, on May 3-5, 1954.

A Program Committee consisting of leading operating men and equipment manufacturers has already been organized. They will meet about the middle of next month to select subjects for papers and speakers to present them. To aid in its work the committee will appreciate all suggestions from the industry as to speakers and topics to be discussed at the Convention. Suggestions should be sent to the American Mining Congress, Ring Building, Washington 6, D. C.

Central theme of the Convention next spring will be determined by the cross-section of industry opinion as reflected in the large number of suggestions received by the Program Committee. These are crucial times for the coal industry and the 1954 AMC Coal Convention will be the most important coal meeting of the year. Plan now to be there.

Convention headquarters will be in the Netherlands Plaza Hotel. Reservations should be made direct with this or other hotels in Cincinnati. To avoid disappointment, specify date of arrival and departure as well as type of accommodations preferred.

Three appointments to executive posts in United States Vanadium Co., a division of Union Carbide and Carbon Corp., have been announced. **O. F. Holmgren** has been named executive vice-president; **A. P. Cortelyou**, vice-president; and **H. L. McKinley**, general manager.

Holmgren, the new executive vice president, has been associated with various activities of divisions of Union Carbide since 1924. He has been with United States Vanadium Co. since 1942, and was appointed vice-president of the company in 1948.

O. F. Holmgren

Cortelyou, newly-appointed vice-president, has served as general manager since 1951. He joined Union Carbide in 1930, and has spent much of his time with the corporation investigating ore deposits in all parts of the world.

McKinley, who takes over the post of general manager, has been engaged in mining and milling activities with United States Vanadium, both as metallurgist and general superintendent, since 1940.

A. P. Cortelyou

H. L. McKinley

Holmgren and Cortelyou will continue to make their headquarters in New York City; while McKinley will be at the Pine Creek mine, near Bishop, Calif. He will also supervise the company's extensive uranium and vanadium operations in the Colorado Plateau area.

It was recently announced that **James S. Laird**, general superintendent, has been elected vice-president, general manager and member of the Board of Directors for the Gay Coal & Coke Co. and Gay Mining Co. He succeeds the late Harry S. Gay. Before coming with Gay Mining Co., Laird was associated with Island Creek Coal Co. and Eastern Gas & Fuel Associates.

Moss Browning, mine foreman at Gay Coal & Coke's No. 3 mine, has been named superintendent, and **Fonzo E. Vincent**, superintendent for Gay since 1941, will continue in charge of mining operations for that company. It was also announced that no changes in policy or personnel were contemplated for either company.

W. Howard Winn was recently appointed smelter superintendent of the Chino Mines Division, Kennecott Copper Corp., it was announced by W. H. Goodrich, Chino general manager. Goodrich also announced the appointment of **Wesley Dow** as assistant smelter superintendent. Effective date of the appointment was July 1.

Winn succeeds **E. A. Slover**, who was recently made assistant general manager at Chino.

After 44 years in the coal industry, **C. E. Boyett** has retired from the Peabody Coal Co. At the time of his retirement, Boyette was serving as master mechanic and top foreman at Peabody's No. 43 mine, Harco, Ill.

E. R. Rowley has been named president of Titanium Metals Corp. of America, a subsidiary of National Lead Co. and Allegheny Ludlum Steel Corp. He succeeds **H. C. Wildner**, who is vice-president and a director of National Lead Co.

P. C. Muccilli was appointed production manager of National Lead Co., succeeding Rowley.

— *Obituaries* —

James S. Dixon, 52, superintendent of the M. and W. Mining Co. at Zincville, Okla., died in Picher, Okla., on August 20.

Littleton C. Barkley died on August 27. At the time of his death he was general sales manager, West Coast Division, Raybestos - Manhattan, Inc. He had worked for the company for 27 years.

William Morgan McClean, 83, mining engineer in the Helena (Mont.) area for many years, died July 20.

E. L. Bailey, 65, former West Virginia state road commissioner and mines chief, died on September 10 in McMillan Hospital, Charleston, W. Va., after a long illness.

Fred W. Emerson, purchasing agent for the Lehigh Valley Coal Co. for the past 20 years, died at Wilkes-Barre, Pa., on August 19.

John C. Hatcher, 78, former owner of the Elkhorn Block Coal Co. of Ashland, Ky., died on September 13 at his home in Lexington, Ky., following a long illness.

Clyde Craggs, mechanical engineer at Salt Lake City for the United States Smelting, Refining and Mining Co., died August 28. He was 56 years old.

John Hocking, 56, superintendent of the Minnesota iron mining operations of Republic Steel Corp., died in Hibbing, Minn., September 21. Mr. Hocking was a prominent figure on the Iron Ranges.

Lewis Webster Wickes, 74, died on September 16 at his home in Los Angeles. At the time of his death he was a directer and treasurer of Cyprus Mines Corp., and treasurer and director of Cactus Mines Co.

Mr. Wickes' career was long and varied in the mining industry. It includes experience as assayer and surveyor at various mines in Colorado; chemist at the Anaconda Smelter; head chemist at the East Helena Plant of American Smelting and Refining Co.; several field seasons with the U. S. Geological Survey; field engineer for A.S.&R. and Gunn Thompson Co.; superintendent for Cumberland Ely Copper Co. and the Ely Witch Copper Co.; manager of Nevada-Utah Mining & Smelting Corp.; a private consulting practice; and mine operations and investigations all over the world.

During World War I he served two years as a Major in the Engineer Corps, seeing service in France. He contributed many extremely worthwhile papers to technical journals. His passing away leaves a definite hole in the ranks of the mining profession.

William Boyd Milliken, 80, Denver, Colo., died August 19 after an illness of several months. He owned and operated gold mines in Cripple Creek and Idaho Springs, Colo.; Nevada and Nicaragua, and had acted as consulting engineer for several Colorado mining firms. He served on the Board of Land Commissioners until his retirement in 1949.

Alexander Jack, 62, former vice-president of the Pennsylvania Coal & Coke Corp., died September 13 at Altoona, Pa. Mr. Jack had served as general manager of Pennsylvania Coal & Coke from 1934 to 1948, when he was elevated to the vice-presidency. He resigned in 1950 to accept a position with the Government, sealing mines in Clarion County, Pa. He left the coal company for one year, from 1942 to 1943, when he was senior Federal coal mine inspector at Birmingham, Ala.

Before joining the coal company as general manager, Mr. Jack served eight years as an inspector with the Pennsylvania department of mines and had held positions as mine foreman for several coal mining companies in Pennsylvania.

Steel Rail Sets

(Continued from page 52)

ting is made of sheets. This material is used in place of wood lagging. Through a fortunate purchase this material costs less per square foot than wood lagging. Our cost on wood lagging is $52.50 per thousand. Of course, the supply of this material is limited. In normal times we think we can use a corrugated metal or screen.

Collar braces are made from light rails, of any suitable shape. We have used scrap brake beam channels from the railroad.

Costs Analyzed

Many things enter into cost. The price paid for material is the determining factor. Every mine makes considerable steel scrap. No piece is sold that is five ft long. Plates excepted, this material is all used for sets. Naturally sets made from this material cost less. The charge for this steel is the current selling price of steel scrap.

To arrive at an average cost take a set made of 65-lb rail. This rail costs from $25 to $65 per ton—assume $35 as an average. Scrap plates are used for flanges and connections. The cost of this set was $15.25 for labor and material, allowing no overhead and labor at $1.375 per hour. Of course, cost is less when we use our own scrap. Comparing this to a 10 by 10-in. Oregon fir set. Cost on this material is approximately $80 per thousand board feet. Posts and caps are cut to length and bought in carload lots. Labor per set (no overhead) is $1.40 for all labor; framing, hauling, and piling. Total cost per set, labor and material, $14.65. Costs for steel or wood in this size is approximately the same. Wood sets cost considerably more if they are not made in large lots.

Advantages Summarized

Steel sets are easier to install than wood sets. In timber repair, cost per set is less in new work. Steel sets go in at least 25 percent faster than wood. The lifting of heavy caps is eliminated.

One of the most favorable features of this program is the attitude of the men. Timbermen miners and all bosses much prefer steel over wood.

This system was developed to suit conditions at our mine and may be of no value at other places. Disregarding the life of the steel versus wood, which is the greatest advantage, we do manufacture and install these sets for less than a wood set.

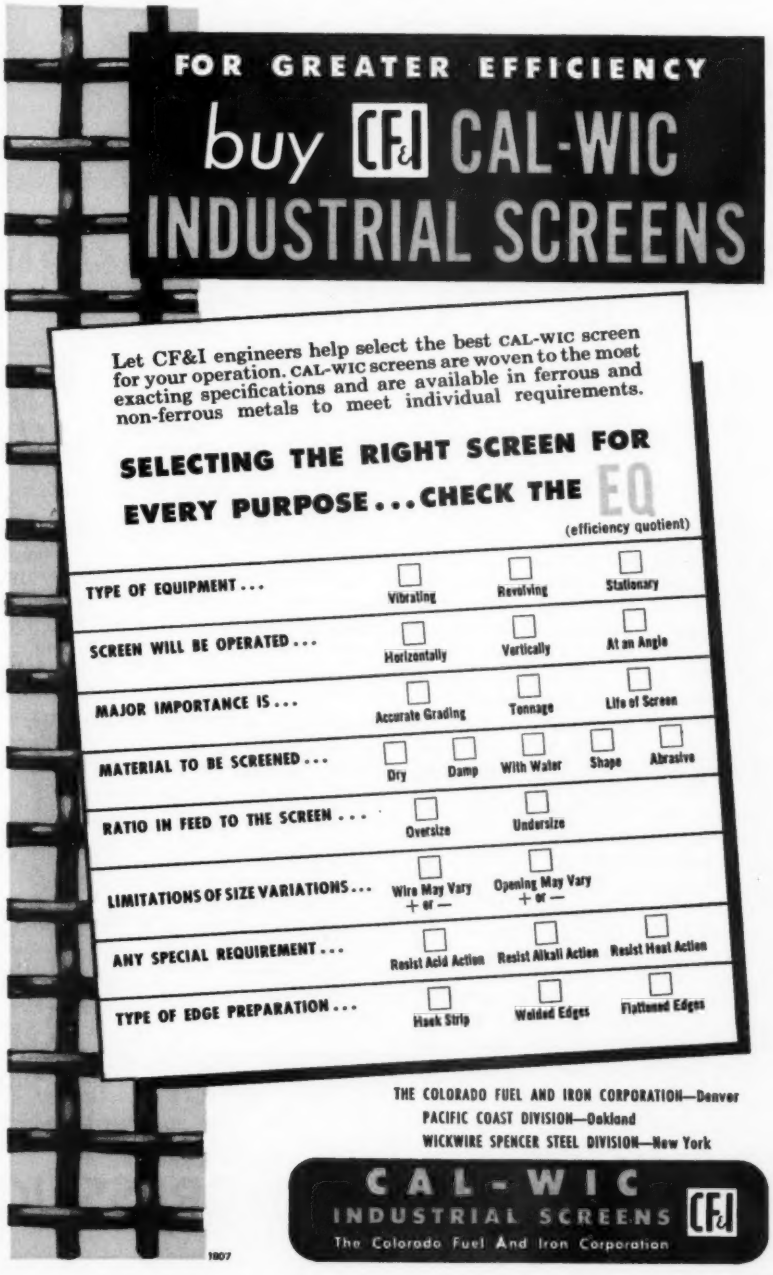
Some sets have been in place about six years with practically no failures. Wood sets often placed side by side have had to be replaced.

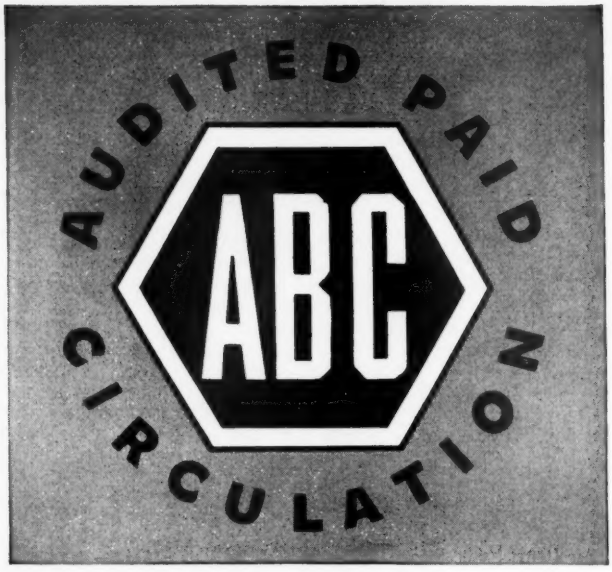
AMC

THE FULL REPORT on the American Mining Congress Metal and Nonmetallic Mining Convention recently held in Seattle will appear in our

NOVEMBER ISSUE

Watch for your copy!


FOR GREATER EFFICIENCY
buy CF&I CAL-WIC
INDUSTRIAL SCREENS
Let CF&I engineers help select the best CAL-WIC screen for your operation. CAL-WIC screens are woven to the most exacting specifications and are available in ferrous and non-ferrous metals to meet individual requirements.
SELECTING THE RIGHT SCREEN FOR EVERY PURPOSE...CHECK THE EQ
(efficiency quotient)
TYPE OF EQUIPMENT... Vibrating Revolving Stationary
SCREEN WILL BE OPERATED... Horizontally Vertically At an Angle
MAJOR IMPORTANCE IS... Accurate Grading Tonnage Life of Screen
MATERIAL TO BE SCREENED... Dry Damp With Water Shape Abrasive
RATIO IN FEED TO THE SCREEN... Oversize Undersize
LIMITATIONS OF SIZE VARIATIONS... Wire May Vary + or — Opening May Vary + or —
ANY SPECIAL REQUIREMENT... Resist Acid Action Resist Alkali Action Resist Heat Action
TYPE OF EDGE PREPARATION... Hook Strip Welded Edges Flattened Edges
THE COLORADO FUEL AND IRON CORPORATION—Denver
PACIFIC COAST DIVISION—Oakland
WICKWIRE SPENCER STEEL DIVISION—New York
CAL-WIC
INDUSTRIAL SCREENS
The Colorado Fuel And Iron Corporation
CF&I
1807



The Hallmark of Circulation Value

Three thousand four hundred and fifty advertiser, agency and publisher members of the Audit Bureau of Circulations have a voice in establishing and maintaining the standards responsible for the recognition of this emblem as the Hallmark of Circulation Value. It represents the standard of value that these buyers and sellers of advertising space have jointly established as measurement for the circulation of printed media.

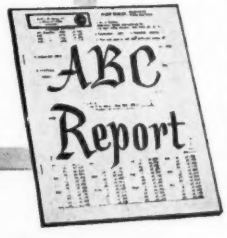
The basis for arriving at the advertising value of a publication is the Bureau's single definition of net paid circulation. With this as the standard, the circulation records of A.B.C. publisher members are audited by experienced circulation auditors. As specified in the Bureau's Bylaws, A.B.C. auditors have "access to all books and records."

Subscription and renewal orders, payments from subscribers, paper purchases, postal receipts, arrears are among the publisher's circulation records that are painstakingly checked by auditors and the resulting data are condensed and published in A.B.C. Reports.

Experienced space buyers use the audited information in A.B.C. Reports as a factual basis for their decisions in evaluating, comparing and selecting media. The FACTS in A.B.C. Reports for business publications include: • How much paid circulation • How much unpaid distribution • Occupational or business breakdown of subscribers • Where they are located • How much subscribers pay • Whether or not premiums are used • How many subscribers in arrears • What percentage of subscribers renew.

SEND THE RIGHT MESSAGE TO THE RIGHT PEOPLE

Paid subscriptions and renewals, as defined by A.B.C. standards, indicate an audience that has responded to a publication's editorial appeal. With the interests of readers thus identified, it becomes possible to reach specialized groups effectively with specialized advertising appeals.



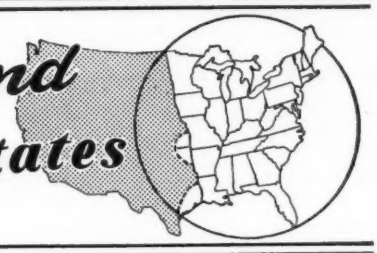
This publication is a member of the Audit Bureau of Circulations and is proud to display the Hallmark of Circulation Value as the emblem of our cooperation with advertisers. Ask for a copy of our A.B.C. Report and then study it.

MINING CONGRESS JOURNAL

A.B.C. REPORTS—FACTS AS A BASIC MEASURE OF ADVERTISING VALUE

NEWS and VIEWS

Eastern and Central states



J. J. Forbes Stays

Undersecretary of the Interior, Ralph A. Tudor, has announced that J. J. Forbes will remain as director of the Bureau of Mines until he retires November 11, 1955.

J. J. Forbes

Tudor reported that Harry M. Moses of the Bituminous Coal Operators' Association suggested that Forbes be permitted to stay and Secretary Douglas McKay agreed. Moses and John L. Lewis conferred later with McKay, Tudor and Assistant Secretary Felix Wormser. After the conference, Tudor said no successor to Forbes had been discussed and that there had been no discussion of his replacement.

Cement Plant Overhauled

Blaine S. Smith, president of the United States Steel Corp. subsidiary, Universal Atlas Cement Co., announced recently that rebuilding of the 47-year-old cement plant at Universal, Pa., is about ⅓ completed. Work has been under way since May. When the modernization program is completed, the new push-button mill will have only two large smoke stacks compared to the 38 which it now has. Engineering plans call for the installation of a mechanical dust collector and electrostatic precipitator to control stack emissions.

New construction is expected to be completed late in 1955 and will make the plant one of the most modern cement plants in the United States.

Smith pointed out that the new mill is the result of almost 10 years of intensive research and experiment by company engineers under the direction of H. P. Reid, vice-president in charge of engineering. Design of the new mill calls for three new buildings to replace the four which now house the coal mill, raw mill, burner mill and finishing mill. Razing of the old buildings and erection of the new mills is being accomplished without interruption of daily production.

In connection with the modernization program, T. C. Wurtz, director of the Allegheny County Smoke Control Bureau said in part, "This is another example of industry's fine cooperation in clearing the skies of Allegheny County and I congratulate the management of U. S. Steel and its subsidiary Universal Atlas Cement Co. on this forward step."

Hold Resources Conference

A Mid-Century Conference has been called by Resources' for the Future, Inc., a non-profit corporation for research and education in the field of natural resources. The agency has received a grant from the Ford Foundation for conducting the conference. It is to be held in Washington, D. C., December 2, 3 and 4.

DAVIS READ
Consulting Engineer
Layout Operation
Modern Production Methods
Plant Design Preparation
Chicago, Ill. 120 S. LaSalle St.
Madisonville, Ky. 235 East Noel Ave.

PETER F. LOFTUS CORPORATION
ENGINEERING and ARCHITECTURAL CONSULTANTS and DESIGNERS
First National Bank Bldg.
Pittsburgh 22, Pennsylvania
Cable Address
"LOFTUS Pittsburgh"

L. E. YOUNG
Consulting Engineer
Mine Mechanization
Mine Management
Oliver Building Pittsburgh, Pa.

J. W. WOOMER & ASSOCIATES
Consulting Mining Engineers
Modern Mining Systems and Designs
Foreign and Domestic Mining Reports
UNION TRUST BLDG.
Pittsburgh, Penna.
NATIONAL BANK BLDG.
Wheeling, W. Va.

Award Cleaning Plant Contract

David Z. Norton Co., a division of Oglebay Norton and Co., Cleveland, Ohio, has awarded a contract to Nelson L. Davis Co., Chicago, for a 150 tph capacity dense media float and sink coal cleaning plant to be erected at a new mine operation to be known as Davis Z. Norton Mine No. 3 near Powhatan Point, Belmont County, Ohio.

This plant will clean 6-in. by ¼-in. coal at any predetermined specific gravity within the limits of 1.35 and 1.70.

Steel May Use More Coal

The coal, steel, and electric utility industries could make or save many millions of dollars as a result of a two-year research project just completed by 14 electric utility companies and Bituminous Coal Research, Inc.

Approximately 83,000,000 tons or 89 percent of total United States steel is made in open hearths. Most of this is low-carbon steel. The electric utility industry and the coal industry, knowing that both would benefit materially if electric furnaces replaced open hearths, joined forces to conduct a comprehensive technical-economic study to discover whether the electric furnace could compete with the open hearth for this major part of the Nation's steel production. They discovered that replacing open hearth furnaces by electric furnaces could, (1) decrease the cost of making low-carbon steel from cold metal up to $3.15 per ton, (2) increase the national output of electricity by 12 percent, and (3) increase coal production about 25,000,000 tons a year. The latter two estimates assume a total replacement of the existing 950 open hearth furnaces by 760 electric furnaces.

Open hearths are fired primarily with oil; electric furnaces operate on power usually generated from coal. Future changes in costs of fuels and metals used by the electric furnace and the open hearth are expected to favor the electric furnace.

Manufacturers who supply or service the coal, electric, and steel industries also stand to increase sales by many millions of dollars. For example, the 25,000,000 tons of coal needed annually for generating the additional electricity would mean $25,000,000 worth of mining equipment.

Even a 10 percent switch to electric furnaces in the near future holds tremendous importance to the industries concerned. Almost 7,000,000 tons of alloy and low-carbon steels were made in electric furnaces last year.

Blending Installation Cuts Production Costs

with

SYNTRON

VIBRATORY FEEDERS

Syntron Feeders deliver four different ingredients to conveyor belt.

Installed in groups to feed several different materials for a blending operation, or singly to speed the flow of bulk materials—Syntron Vibratory Feeders assure accurate, variably controlled handling of bulk materials at any desired rate of feed. Electromagnetic operation—no mechanical wearing parts—low cost.

Write today for complete catalogue—Free

SYNTRON COMPANY

703 Lexington Ave. Homer City, Pa.

Pa. To Seal Abandoned Mines

The Pennsylvania State Department of Mines has received an appropriation of $1,500,000 for "the sealing, dewatering and extinguishment of fires in abandoned coal mines."

It has been decided that a part of the money apportioned to the Department of Mines is to be used in the sealing of abandoned mines. Preliminary studies are now being made by the department to determine in which areas of the state projects should be conducted. A small project has already been started in the Meyersdale-Somerset County area.

Win Minnesota Scholarships

Seven University of Minnesota students are winners of the first scholarships in mining and metallurgy sponsored by the Lake Superior Mining Institute and a group of iron mining industries. George B. Risty, director of the Bureau of Student Loans and Scholarships, announced the following winners of Lake Superior Mining Institute scholarships for the coming year: Charles L. Hansing, Clarence E. Henke, Jack S. Rother and John C. Stone.

Winners of the Iron Mining Industry scholarships are Marcus L. Hovland, Davis U. Rice and Melvin C. Vagle.

Slope for Montour 4

An 800-ft slope is being driven at the Montour No. 4 mine of the Pittsburgh Coal Co., Division of Pittsburgh Consolidation Coal Co. The mine is located near Lawrence, Pa.

As soon as the slope is finished, a belt conveyor installed, and an underground dump constructed, Montour No. 4 will abandon the shaft now being used for hoisting coal. The R. G. Johnson Co. of Washington, Pa., is driving the slope.

Weirton Mine to Consol

Pittsburgh Consolidation Coal Co. announced October 1 the purchase of the Weirton Mine, near Morgantown, W. Va., from National Steel Corp. for a consideration of $1,500,000.

The property purchased consists of 1250 acres of surface land; about 5200 acres of thin-vein Freeport coal which has been partially mined; the mine proper, machinery, equipment, and supplies; and the above-ground plant and buildings.

Pitt Consol does not plan to re-open the mine, which has been closed since June 27, 1953. Such equipment, machinery, and supplies as can be advantageously used in other mines of Pitt Consol will be transferred to these operations, the company stated.

Annual Conference of the Coal Division

William Penn Hotel, Pittsburgh, Pa., Friday, November 13, 1953

A CORDIAL invitation is extended to all coal operators and manufacturers interested in the development of improved coal mining methods and equipment to attend the 1953 Conference of our Coal Division. This will be held at the William Penn Hotel in Pittsburgh, November 13.

The meeting will be an open forum where the committees will present their reports for discussion. Copies of each report, in preliminary form, will be available. Comments and suggestions for any further studies that may be of service to the industry are invited.

Seven committees will report as follows:

Committee on Roof Action—Materials and Methods of Roof Support—Mine Roof Sealing——Maintenance for Roof Drills and Bits—Geological Study on Mine Roof Formations—Recovery of Roof Bolts.

Committee on Conveyor Mining—Methods of Belt Loading—Belt Fire Prevention—Man-Trips and Supply Handling.

Committee on Haulage Roads—Standards for Heavy Rail Turnouts—Determination of Proper Mine Car Capacities—Prevention of Block Signal Violations.

Committee on Mine Ventilation—Control of Airborne Dust—Sealing or Ventilating Mined Areas.

Committee on Surface Preparation—Preparation Problems of Full Seam Mining—Preparation Problems of Continuous Mining—Prevention of Stream Pollution.

Committee on Mechanical Loading—Service Haulage for Continuous Mining—Shuttlecar Roadways—Continuous Machine Maintenance.

Committee on Underground Power—Specifications for High Voltage Cables—Cable and Hose Conduit Sizes—Underground Installation of High Voltage Cables—Mining Machine Motor Identification.

Jensie Wins in Ohio

The Jensie Mine of Warner Collieries carried off top honors in first aid at the 9th Annual Ohio Miners' Safety and Accident Prevention meet held recently at Bridgeport, Ohio. The Jensie mine is located at East Springfield, Ohio. Second place went to Piney Fork Mine of the Hanna Coal Co., and third place to team No. 2, Dun Glen Mine, Hanna Coal Co.

Approximately 10,000 persons witnessed the contest along with other entertainment, including a ball game and individual competition of various types.

Electrify Coal Shaft

The Hudson Coal Co. announced completion of the electrification of its Grassy Island shaft. This step will permit the consolidation of all steam facilities for power generation in one building. The project was undertaken as part of Hudson's modernization program. It will free a considerable tonnage of steam-sized anthracite, now in short supply, as well as increase the efficiency and safety of the operation. The company has installed a total of 1200 hp for operation of the shafts, ventilating fans, and compressors. In addition, waste rock will be hauled to the Eddy Creek mine for disposal. This eliminates the need of an additional motor at Grassy Island, and also means a saving in manpower.

Provide 125 volt to 550 volt direct current for Mining Machinery—Haulage Locomotives — Elevators — Cranes — Hoists — Machine Tool Motors — Printing Press Motors—Synchronous Motor Excitation—Magnetic Chucks — High Intensity Arc Lights — and general d-c Power Service.

Conversion Units are made up with Syntron's own high quality Selenium Rectifiers. Require no warm up period. Highly efficient, sturdy power units with automatic voltage regulation.

POWER CONVERSION UNITS

For Changing High Voltage AC to DC

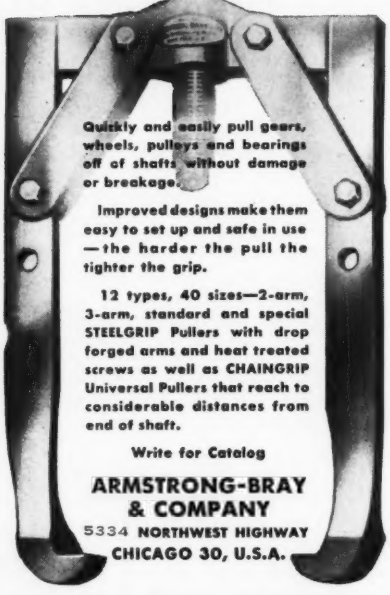
"Packaged Power Units – Ready For Operation"

Write today for free catalogue data.

SYNTRON COMPANY

703 Lexington Ave. Homer City, Pa.

ARMSTRONG-BRAY
GEAR and WHEEL PULLERS



Quickly and easily pull gears, wheels, pulleys and bearings off of shafts without damage or breakage.

Improved designs make them easy to set up and safe in use —the harder the pull the tighter the grip.

12 types, 40 sizes—2-arm, 3-arm, standard and special STEELGRIP Pullers with drop forged arms and heat treated screws as well as CHAINGRIP Universal Pullers that reach to considerable distances from end of shaft.

Write for Catalog

ARMSTRONG-BRAY & COMPANY
5334 NORTHWEST HIGHWAY
CHICAGO 30, U.S.A.

More Foreign Bauxite

Richard S. Reynolds, Jr., president of Reynolds Metals Co., has announced that Reynolds Mining Corp., a wholly-owned subsidiary, has begun the development of its aluminum ore reserves in Haiti.

Reynolds Mining Corp. president, Walter L. Rice, reports that the principal deposits of the company are located about 80 miles from Port-au-Prince near the port of Miragoane. The deposits are five miles from deep water and extend over an area along a plateau approximately 2500 to 3000 ft above sea level.

Construction equipment has been sent to Haiti to prepare the shore site and to build a 12-mile mountain road descending from an altitude of 3000 ft. Drying and loading facilities will be installed at the shore, and a pier will be constructed for loading all types of ore carriers.

Form Tungsten Institute

The Tungsten Institute of Washington, D. C., has been formed to foster the progress of the American tungsten industry, to promote the use of tungsten and to afford means of cooperation between the tungsten mining industry and the federal government in all matters tending to promote the national defense and other matters of national concern. It also intends to promote mutual improvement of its members and study of the metallurgy of and the arts and sciences connected with the tungsten industry.

Charles H. Segerstrom, Jr., of Nevada has been named vice-president. Also on the board are Roy A. Hardy, Getchell Mines, Inc., Reno, Nev.; John M. Heizer, Wolfram Co., John W. Hoefling, Surcease Mining Co., and A. R. McGuire, Nevada Scheelite Division, Kennemetal Inc.

Open W. Va. Coal Field

A 13-mile railroad spur is being constructed to tap an estimated 30 to 50,000,000 tons of coal in Fayette County, W. Va. Bulk of the coal is contained in the Fire Creek and Sewell seams. Codell Construction Co. of Winchester, Ky., is constructing the line beginning near Russelville, W. Va., and ending at Landisburg, W. Va., for the Nicholas, Fayette and Greenbrier Railroad, owned jointly by the New York Central and the Chesapeake & Ohio.

It is estimated that output from the coal fields being tapped will reach an average of 1,000,000 tons a year within five years after completion of the extension, scheduled for midsummer of 1954. Much of the coal is metallurgical coking grade.

You too can save with Oriented Diamond Core Bits

Hoffman Brothers has been engaged in contract diamond core drilling since 1902, with more than fifty drills in constant use. We take advantage of every savings possible—and we've found the ORIENTED BIT to be a real money saver.

The Mining Research Branch of the United States Bureau of Mines, Region VIII, Bluemont, Virginia, issued a release last February stating that diamonds have a hard and a soft vector, or side. A diamond set at the proper angle will give longer life, cut faster, and have less wear than a random set stone. We tried this theory—and now know it is not a theory BUT A FACT.

Hoffman Brothers have used over 500 ORIENTED CORE BITS on their own rigs and have sold an equal number to others, including the Bureau of Mines.

The ORIENTED BIT is the biggest boon to drilling since the advent of the cast set bit. EVERYONE HAS BEEN SATISFIED WITH THEIR PERFORMANCE!

Due to demand, Hoffman Brothers has entered the field of ORIENTED BIT MANUFACTURING FOR OTHERS. For further information, write, wire or phone us today. No obligation.

The only truly set Diamond Core Bit is the ORIENTED DIAMOND CORE BIT.

HOFFMAN BROTHERS DRILLING COMPANY
INCORPORATED
COUNTY NATIONAL BANK BUILDING PUNXSUTAWNEY, PENNA.
PHONE NUMBERS 382 OR 1605

Coal Laboratory Completed

The bituminous coal industry recently completed the first industry-owned laboratory to expedite its continuing program to help customers get maximum value from coal.

This laboratory for the General Research Program of Bituminous Coal Research, Inc., is at Kinnear and Kenny Roads, Columbus, Ohio. It will house the BCR Columbus staff headed by Elmer R. Kaiser, associate director of research.

The coal industry's research agency carries on technical and administrative activities at its General Research Program headquarters in Pittsburgh, Pa., coal-fired gas turbine research at Dunkirk, N. Y., and mining research in Huntington, W. Va. Its fiscal office is at Washington, D. C.

The scope of activities at the Columbus laboratory will include research, engineering development, and technical promotion. Typical projects are: research and development of automatic steam generators and gas producers for industry, automatic coal-burning equipment for home heating, combustion without air pollution, crop dryers and poultry-barn heating for farms, and area heating for cities.

SYNTRON

"Vibrating"

TEST SIEVE SHAKERS

Eliminate all Guesswork

Provide definite sizing of test samples

- Use standard 8" Screen Scale Testing Sieves
- A reset timer for accurately timed test periods
- Controlled electromagnetic vibration—no motors, pulleys, etc.

Write Today for FREE Catalog Folder

SYNTRON COMPANY
703 LEXINGTON AVE.
HOMER CITY, PA.

McCarthy Auger Drills

CUT DRILLING COSTS

Heavy Rugged Powerful

SELF-PROPELLED

Workers at Cedar Creek Coal Company, Stigler, Okla., using a McCarthy Self-Propelled Blast Hole Drill, bore through shale high-wall prior to blasting. Bill Mathews, Canton, Ohio, operator, drilled 1800 ft. of 6" diameter holes in one day using this same model. This drill works in tight quarters, and quickly adjusts on four separate leveling jacks to proper drilling height. Drills 4" to 12" blast holes up to 120 ft. deep. Excellent for low level work as shown here.

HORIZONTAL TRUCK-MOUNTED

A truck-mounted Horizontal McCarthy Blast Hole Drill at work at the Lingle Coal Company, Shawville, Pa. Rugged, fast, mobile and powerful, this unit bores 4" to 12" holes, averaging 1500 ft. per day with a two-man crew. McCarthy Drills work easily to depths of 100 ft. or more using 6-ft. auger sections. Being truck-mounted, all equipment, auger sections and operators are up out of the mud . . . free to work easier and faster. Mobility of truck allows drill to be moved from hole to hole quickly. Saves time! Saves money!

30" COAL RECOVERY DRILLS

A husky, power-driven 30" McCarthy Coal Recovery Drill extracts coal after stripping operations become unprofitable. This project, in West Virginia, using only seventeen 6-ft. auger sections, drills 102 ft. horizontally into the coal vein. A three-man crew produces 90 tons of high-grade clean coal (otherwise unobtainable) in an eight-hour shift. A portable conveyor loads coal directly onto trucks from the drill. Write The Salem Tool Company, Salem, Ohio, and a distributor will call on you.

THE SALEM TOOL COMPANY

779 S. ELLSWORTH AVE. • SALEM, OHIO, U. S. A.

Summary of -

ROOF BOLT TESTS MADE BY A LEADING UNIVERSITY . . .

Under direction of members of the Mining College of a leading University, tests were made recently to determine the load strength of Pattin double expansion shells. They were installed in test holes (1⅜") drilled horizontally into the solid face of unquarried stone. The bolts were tightened to approximately 150 foot-pounds with a torque wrench, and the testing load was then applied by a roof bolt pull-tester.

Following is a report of the test:

Using a heat-treated bolt and a ¾" Pattin double expansion shell, the assembly was installed in a 1⅜" hole. At 6 tons, movement at the bolt head was ⅛" and at 20 tons ¼". After exerting a pull of 20-plus tons it was found that the shell had not moved in the hole. The photograph below was taken when the bolt began to stretch after reaching 20 plus tons on the meter. Test after test—in mines and laboratories—have proved PATTIN shells superior to all others which accounts for so many mine operators, coal and metal, specifying PATTIN roof bolt products.

Our engineers are available for consultation and demonstrations. Write or phone us—we'll gladly work with you on any present or future bolting program.

PATTIN
MANUFACTURING CO.
MARIETTA, OHIO
EST. 1888

Pa. Shot-Firers Use Lamps

Section 14 of Article 4 of the Bituminous Mining Law of Pennsylvania has been amended to permit shot-firers to carry electric lamps, approved by the Secretary of Mines, while performing their duties. Before this amendment, a shot-firer had to perform his duties using no other light than an approved flame safety lamp.

N&W Sticks With Coal

The Norfolk and Western Railway has recently purchased a new coal-burning steam turbine electric locomotive. Construction of the locomotive was a joint project of Baldwin-Lima - Hamilton, Westinghouse Electric, Babcock & Wilcox, and the N&W.

The locomotive weighs 765,000 lbs, has an over-all length of 111 ft, 7½ in., and a starting tractive effort of 175,000 lbs.

Mineral Wool in R. I.

A report which indicates that satisfactory mineral-wool insulation can be made from Rhode Island meta-anthracite coal and limestone and which describes a practical method of production has just been published by the Engineering Experiment Station of the University of Rhode Island.

The 35-page bulletin entitled "A Slagging Gas Produced for the Production of Mineral Wool from Rhode Island Meta-Anthracite" may be obtained by writing to Dr. T. Stephen Crawford, director of the Engineering Experiment Station in Kingston.

Co-authors of the booklet are Dr. Crawford, Richard C. Corey, C. H. Schwartz, and L. A. Spano of the United States Bureau of Mines and E. L. Carpenter, assistant research professor at the university. The detailed report is the result of pilot-scale experiments carried on jointly by the Experiment Station and the Bureau of Mines.

The report states that by using a slagging gas producer for manufacturing the insulation material enough gas is obtained as a by-product to more than satisfy all heat requirements.

To Make By-Product Iron Ore

The International Nickel Co. of Canada, Ltd., has announced that in an historic mining development it was undertaking the production of by-product iron ore from nickel ores in the Sudbury District of Ontario, where its mining operations are centered.

Outlining plans for the project, J. Roy Gordon, vice-president and general manager of Canadian Operations, said the company was beginning immediately the construction of a $16,000,000 plant in the Copper Cliff area as the first unit in an operation which will ultimately yield about 1,000,000 tons of high-grade iron ore a year, in addition to nickel, from Sudbury ores.

A new process, developed by the company's research staffs, made the undertaking possible, Gordon stated. A most important feature of the project is the resultant release of smelter capacity which permitted Inco to assume the five-year contract it recently signed with the United States Government for delivery of 120,000,000 lb of nickel without diversion of regular supplies from industry.

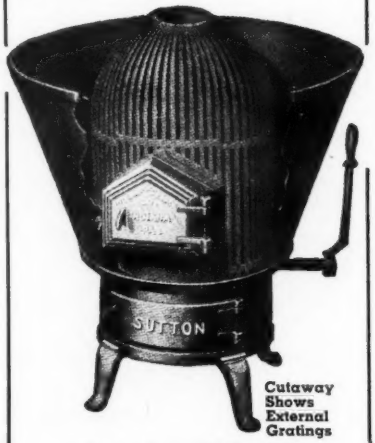
The new plant will supply iron ore higher in grade than any now produced in quantity in North America. Containing at least 65 percent iron natural and less than two percent silica, this ore will command a premium price for direct use in open hearth and electric furnace steel production in Canada and the United States. By comparison, ore from the Mesabi pits of Minnesota contains 51.5 percent iron natural.

Initially the plant will treat 1000 tpd of nickel-bearing pyrrhotite removed from ore in the early stages of processing at Copper Cliff.

The new process, with its yield of iron ore, now makes possible the treatment of lower grade Sudbury ores hitherto considered uneconomical.

"Sutton"

SAND DRYING STOVES



Cutaway Shows External Gratings

For More Efficient Drying of Clean Sand

Sutton Sand Dryers with external gratings have extra capacity and do not burn the sand. Ideal for use by railroads, mines, quarries, and industrial plants. Free catalogue and prices sent upon request.

INDIANA FOUNDRY CO.
156 CLYMER AVE., INDIANA, PA.

170 Coal Mines Close

According to the Keystone Coal Buyers Manual, 170 coal mines in the United States closed down during the period from January, 1952, until July, 1953. The daily capacity of these mines was 212,062 tons.

All coal-producing states were hit, with Pennsylvania leading the list, having 39 bituminous and 10 anthracite mines close. West Virginia followed with 35 closures.

Chattanooga Titanium Plant

Crane Company has selected the Chattanooga, Tenn., area as the site for its new $25,000,000 titanium plant, H. H. Bunchman, vice-president, has announced. The installation will cover some 200 acres about two miles downstream from TVA's Chickamauga Dam. The plant itself will consist of 20 to 24 large industrial type units with about 500,000 sq ft of floor space. It is expected to be ready to go into production late in 1954 or early 1955 and will employ about 1000 men when operating fully.

Du Pont Mines Fla. Ilmenite

A new $3,000,000 mine and plant to produce ilmenite, the raw material for titanium metal and pigments, will be constructed for the Du Pont Co. near Lawtey, in north central Florida, the company has announced.

This will be somewhat similar to Du Pont's Trail Ridge ilmenite plant near Starke, Fla., and the output will help the company meet the increasing demand for titanium metal and titanium pigments.

The construction schedule calls for completing the installation and getting it into operation early in 1955. It will be built and operated for Du Pont by the Humphreys Gold Corp. of Denver, Colo., as in the case of the Trail Ridge plant. Humphreys will also provide some of the major equipment.

It will be known as the Highland plant and will be located on about 5½ sections of land about 17 miles north of the present plant.

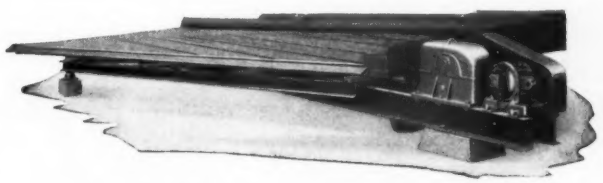
Mining is to be done by a dredge floating on a "traveling lake" which mines Florida's white sands to get out coal-black ilmenite. At the Trail Ridge plant, and as it will be at the Highland plant, the "traveling lake" is about ½ mile long and 500 ft wide. A dredge and separators, floating on the lake, pick up the sand in front, take out the black ore, and pour the sand back in again behind them.

The sand is pulled up by a suction dredge and piped directly to a floating "scrubber" barge. There, the organic coating is removed, and the heavy black mineral is separated from the white sand by a system of spirals in a "wet mill."

The "wet mill" pours the white sand back into the lake as back fill. The concentrated ore is piped to a "dry mill" on land. In this mill, the ilmenite is further concentrated by electromagnetic and electrostatic separators. From there, it is loaded into freight cars and shipped to Du Pont plants at Baltimore, Md., and Edge Moor, Del. Output is about 100,000 tons a year, and capacity of the new plant will be the same.

Key to the feasibility of the operation is the system of separating spirals originally devised by the Humphreys Corp. as an improved method of concentrating gold sands. Humphreys will supply spirals for this operation as it did for the Trail Ridge plant.

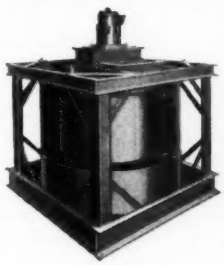
The percentage of ilmenite in the sand is so small that 15 years ago there was no known method for its economic extraction. For every two tons of ilmenite recovered, it will be necessary to dig out about 100 tons of sand. The same situation is true at the Trail Ridge plant. Some deposits being mined elsewhere run up to 75 tons of the ore in every 100 tons of material taken up.



SuperDuty Cleans Fine Coal Sizes With Unsurpassed Efficiency

The measure of efficiency in coal cleaning is not just in the quality of the washed coal product. The SuperDuty Diagonal Deck Table, bowing to none on a quality standard, assures maximum recovery of available coal in the feed . . . and the capacity for optimum cleaning of fine coal is unsurpassed by any other table or process on the market today.

Along with such efficiency, the operating economy of a table installation . . . and its low maintenance costs . . . reward you with a high return on the investment. Large and small operators alike are daily turning to SuperDuty Table cleaning of their fine sizes. Send for Bulletin 119.



CONCENCO FEED DISTRIBUTOR

The Concenco Revolving Feed Distributor is a heavily fabricated all-steel machine with motor drive requiring 1 H.P. or less in operation. It effectively provides a splitting of feed into any desired number of equal portions to serve any number of circuits or machines in battery for over-all efficiency. Unexcelled for feeding coal washing tables.

THE DEISTER★ CONCENTRATOR COMPANY

CONCENCO PRODUCTS

★ *The ORIGINAL Deister Company* ★ *Inc. 1906*

917 Glasgow Ave. • Fort Wayne, Ind., U.S.A.

Macwhyte 6 x 36 WS PREformed Right Lang Lay Monarch Whyte Strand with IWRC.

What's unusual about this machine?

There are 265 wires in this particular rope construction. That means 265 individual moving parts.

The 8 different sizes of wire are all drawn to precise diameters. Each wire is protected with lubricant applied during fabrication of the rope.

Macwhyte makes a thousand and one ropes to meet the needs of every type of equipment. Each is built with the exacting care that long, low-cost service demands. Prompt recommendations on request.

GET THE RIGHT ROPE FOR YOUR MINING EQUIPMENT

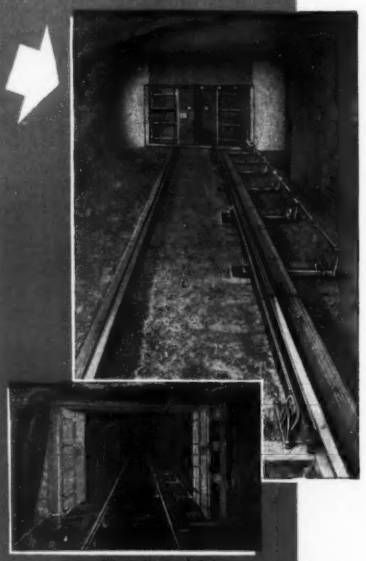
MACWHYTE WIRE ROPE

Ask For G-15 Handbook

1041

MACWHYTE COMPANY
2952 Fourteenth Avenue, Kenosha, Wis.
Mill depots: New York • Pittsburgh • Chicago
St. Paul • Fort Worth • Portland • Seattle
Los Angeles • Distributors throughout U.S.A.

This Door has saved countless lives . . . increased production by millions of tons . . .



Engineered flow of air sweeps out gas pockets, and air flow must be continuous, reliably directed by "Canton" Automatic Doors. Dissipating explosive air is one important function. Providing healthy, breathable air is another function that steps up productivity of every worker. Eliminating that trapper boy accident is another.

Insurance against accidents, increased haulage, continued speed ahead with "Canton" Automatic Doors make it imperative that every mine owner and manager investigate the economy proven by a quarter century of American Mine Door Service.

"CANTON" DOORS ARE SELF LIQUIDATING IN A SHORT PERIOD

Note the photos . . . when the oncoming train rides the trip levers . . . flip, the doors open; when the last car passes . . . release, the doors spring shut . . . positive action and reaction . . . all mechanical in split seconds. Complete literature sent on request, engineering advice given without obligation. When writing, please use street and zone number.

American Mine Door Company
2063 Dueber Avenue
Canton 6, Ohio

Manufacturers of "Dustributors"—Automatic Switch Throwers—Automatic Mine Doors—Mechanical Track Cleaners

Golden Cycle To Mine U-Ore

The Golden Cycle Corp., one of Colorado's veteran gold mining firms, is entering the uranium mining field. Max W. Bowen, vice-president of Golden Cycle, has confirmed that his company has obtained a lease from the Atomic Energy Commission on Atkinson Mesa near Uravan, Colo. A contract has been signed with Eugene Bishop of Boulder, Colo., to sink a 650-ft shaft to the ore deposit. The shaft was down 280 ft by August 31. Golden Cycle will begin mining as soon as the shaft is completed.

According to the AEC Grand Junction office, this will be the deepest shaft ever sunk in the Colorado Plateau area for uranium.

Gold Pocket Found

A strike of high-grade gold ore was reported at the Gold Crown mine near Allegheny, Calif. The mine is located between such famous old gold producers as the Original 16 to 1 and the Oriental. Gold Crown has been under development for the last three years by Fred and Dan Giles and their mother, Harriet Duke. The mine foreman is Al. Novak.

High-grade ore was found on the mine's 400-ft level which is developed through an adit driven on the north side of the canyon of the middle fork of the Yuba River.

Develop Bonanza Mine

Development work continues at the Bonanza mine, southwest of Redrock, Ariz., where the B S and K Mining Co. has reported ore pockets of good zinc and copper ore. Principal work is in exploration and development with production curtailed because of low zinc prices.

Plans announced by the company are to provide for future production of 100 tpd to be milled and concentrated by selective flotation. Since B S and K acquired the 30-plus claims on bonded lease with purchase option, more than 2000 tons of zinc and 300 tons of copper concentrates have been shipped to smelters.

Much of this year's development work has been deepening the mine shaft and extending the drift on the 70-ft level. Plans are to establish two more levels at 50-ft intervals. Meanwhile, the company is exploring by diamond drilling. Operating crew at the mine has been reduced to 13 men, most of them engaged in exploratory work and in deepening the shaft. A. M. Kalaf is president and mine manager.

Plan Virginia City Mill

Joe Butzerin, Spokane, Wash., an incorporator of the Grizzly Bear Mining Co., reports that his firm plans to set up a mill of at least 100 tons on an old Virginia City (Mont.) gold-silver property and will develop the Easton-Pacific group of 19 patented and six unpatented claims formerly under the U. S. Grant Mining Co.

Oriental Mine On New Level

The Oriental gold mine, which was reopened near Allegheny, Calif., in 1950, is now producing ore from a new level, 300 ft below the main adit. The ore is treated in a 75-ton mill at the mine by flotation, concentration on tables and amalgamation.

Drill at Leadville Mine

Leadville Lead Corp. has completed extension of the Dauntless tunnel on company property near Leadville, Colo., and is diamond drilling for ore bodies.

Newmont Explores Tombstone

Newmont Exploration Ltd. has taken over properties of the Tombstone Development Co., Tombstone, Ariz., and begun a systematic exploration program.

A surface crew of 12 men is preparing the West Side shaft for installation of an electric hoist and pumping equipment. It is understood that Newmont plans to dewater the 600-ft level, which means dropping the present water level about 18 in., then diamond drill from that level.

Don Hargrove is superintendent in charge of the present work.

How to
SAVE
on Your ROPE HAULAGE
Sheaves and rollers definitely affect mine haulage costs. Wearing surfaces must be adequately hardened, with interiors and strength members carefully heat treated for toughness. Card sheaves and rollers are made under the same high quality control as Card car wheels—first choice for hundreds of cost conscious mines.
C.S.Card Iron Works Co.
2501 WEST 16TH AVE.
DENVER, COLORADO

New!

JET-LUBE

EXTREME SERVICE LUBRICANTS

√ for extreme heat!
√ for extreme cold!
√ for extreme pressure!

JET-LUBE "OG" OUTSIDE GEAR LUBRICANT

This is one of our specialized products. JET-LUBE "OG" is a hydrous silica grease with the addition of micro-ground moly-disulphide. Has extremely low coeffcient of friction. High tenacity and high water resistance. Low power consumption. Non-melting. All-weather. Increases service life. Reduces operating costs.

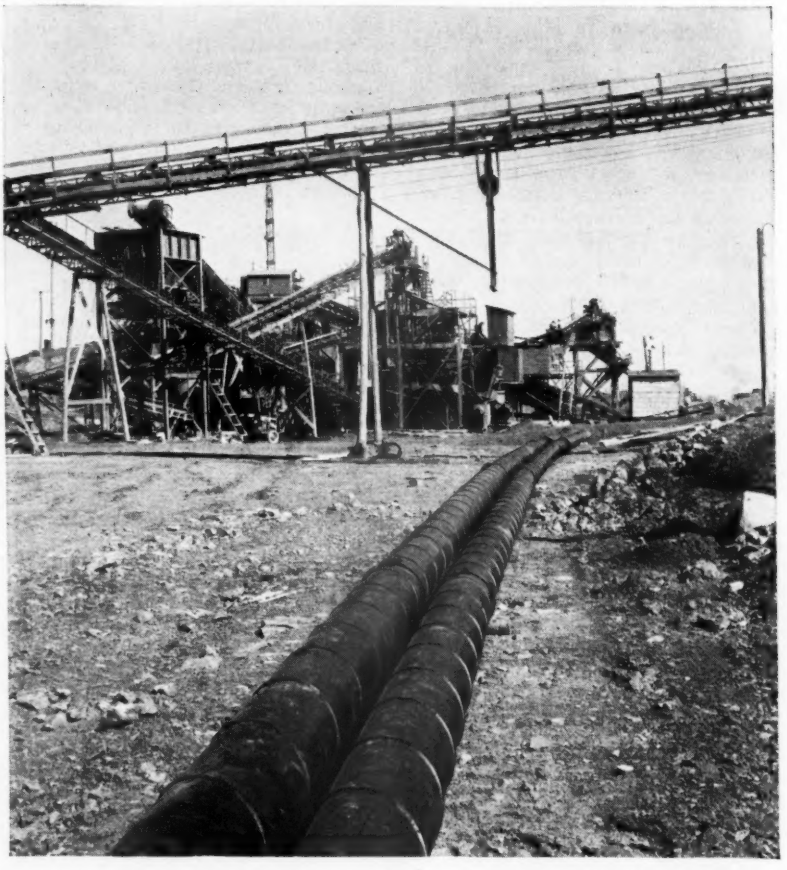
SOLVE YOUR TOUGHEST JOBS WITH A TRIAL SHIPMENT. UNCONDITIONALLY GUARANTEED

Send for complete details

JET-LUBE INC.

7362 W. BEVERLY BLVD., LOS ANGELES 36

SUPER-HIGHWAYS FOR WATER



When it comes to traffic in water, you can depend on Naylor lightweight pipe for uninterrupted service. This distinctive lockseamed, spiralwelded pipe gives you lines that are extra strong, safe, leaktight. Naylor pipe is easy to handle and install—especially with Naylor Wedge-Lock couplings to speed connections. Sizes from 4 to 30 inches in diameter. Write for Bulletins No. 507 and No. 513.

NAYLOR PIPE

NAYLOR PIPE COMPANY
1239 East 92nd Street, Chicago 19, Illinois
New York Office: 350 Madison Avenue, New York 17, New York

Acquire Perlite Property

The Great Lakes Carbon Corp., Perlite Division, Los Angeles, Calif., has acquired the perlite properties of the Alexite Engineering division of Alexander Film Co. Included in the transaction is a perlite mine at Rosita, Calif.

Vacate Wyoming Coal Mine

The Sheridan-Wyoming Coal Co. is vacating its Monarch camp, where 118 men were employed before a consolidation last spring suspended operations at the coal mine.

Amador Purchases Lease

The Amador Mining Co. announced recently its agreement to buy a long-term lease to the Kootenay Copper Mines, Inc., on the Green Mountain Mine, near Dixon, Mont. The mill is being renovated for operation, where it combines treatment of copper ores by flotation, with a gravity concentration for producing a heavy specific gravity concentrate of gold, silver, platinum and palladium.

Nevada Exploration Halted

Consolidated Coppermines Corp. of Kimberly, Nev., has ceased exploration in the Dixie Valley of Churchill County, Nev., after doing some preliminary diamond drilling.

Reopen Resurrection Mill

The Resurrection Mining Co. mill at Leadville, Colo., resumed limited operations, stated Robert L. Jones, who will manage the operation. The mill does custom milling for independent lead and zinc miners. The resumption means employment for about 50 persons, about a fourth of the number employed before the recent shutdown of the mill because of exhaustion of the ore body.

Explore Oregon Mercury Mine

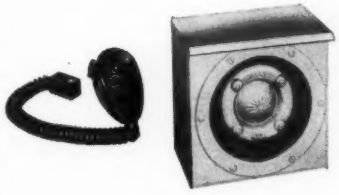
Bonanza Oil and Mine Corp. has received a Defense Minerals Exploration Administration contract. The company is producing up to 100 flasks per mo. from the Bonanza mine near Sutherland, Ore., which it reopened in April of this year. The mine was closed down in December, 1949, when the price of mercury dropped.

The exploration contract is designed to discover new ore bodies in the vicinity of the north and south ore bodies from which major production has come for a number of years. Drifting will be done on the mine's 1050-ft level in the north section and a new drift will be driven on the 830-ft level to prospect the area beneath the south ore shoot which was extensively stoped above the 630-ft level.

Femco

CAGEPHONES
provide low cost
COMMUNICATION
IN DEEP-SHAFT MINES

Safety is improved—production goes up, when Femco equipment is installed. You talk from operator to shaft collar, to moving cage, to surface points and to all levels.



- Femco Communication Systems GET THINGS DONE faster - better - cheaper!
- Easy to BUY or LEASE
  Easy to INSTALL and USE
- DEMONSTRATIONS ARRANGED

Other Femco Products of Merit include:

Femco TROLLEYPHONES

For diesel, trolley or battery locomotives

Femco AUDIOPHONES

Fixed-point industrial communication

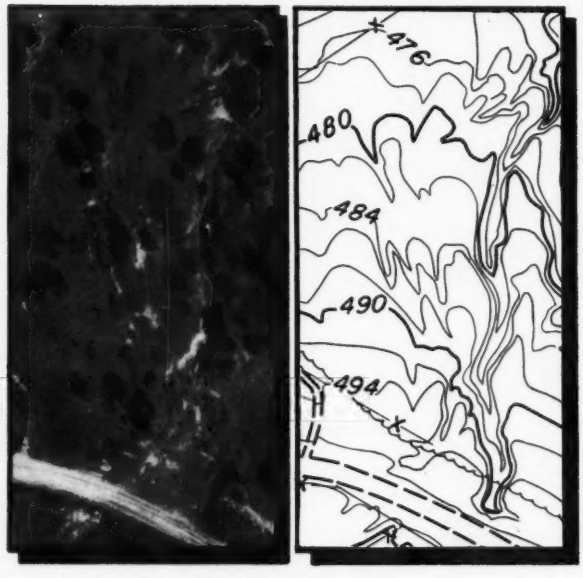
FARMERS ENGINEERING
& MANUFACTURING COMPANY
IRWIN, PENNSYLVANIA

Ask for YOUR Femco Data Kit

Specialists in Electronic Communication and Control

SOLVE MANY OF YOUR EXPLORATION AND DEVELOPMENT PROBLEMS

Right in Your Own Office



(From job produced for McAlester Fuel Co.)

You can easily do this with reliable photo and topographic maps produced by Jack Ammann Photogrammetric Engineers.

We can complete aerial mapping over extremely rugged terrain, or in the most inaccessible areas in a matter of days, compared with weeks or even months that might be necessary to map the same area by conventional ground methods.

Let us save you time and money by assisting you in planning your exploration or development project and producing the type of maps you require.

Jack Ammann
PHOTOGRAMMETRIC ENGINEERS
BROADWAY AT TENTH · SAN ANTONIO 5, TEXAS
AIR SURVEYS—MAPS

Eastern Office: 32 Hillcrest • Manhasset, N. Y.
P. O. Box 411 • Phone Manhasset 7-1840

U. P. Explores In Wyoming

The Union Pacific Railroad has announced it is beginning extensive exploratory mining operations at Iron Mountain, 35 miles northwest of Cheyenne, Wyo. A mining camp with K. L. Cochran, Evanston, UP division geologist, in charge is set up at Iron Mountain and the railroad company is also setting up a permanent mining and petroleum office in Laramie. The exploratory party comprises 25 geologists and drillers.

Cochran reports that the Iron Mountain deposit contains titanium, vanadium and silica but has never been tested metallurgically. The project is expected to last at least two years. The area under study covers about 50 square miles.

Banner Mill Started

Construction of a 400-tpd copper-tungsten flotation-gravity mill for the Banner Mining Co. at Tucson, Ariz., to handle ore from the company's Plumed Knight mine is now under way. The new mill will recover chalcopyrite by flotation and scheelite by gravity concentration. Plans have also been made to recover molybdenite from the ore.

Develop Deer Park Property

The Sunshine Mining Co. has begun development at the old Tungsten King property on Grouse Mountain, 10 miles north of Deer Park, near Idaho's Coeur d'Alene district. Sunshine holds half interest on 80 acres of state-owned land on which it has uncovered four tungsten-bearing veins by bulldozing. An old tunnel near the top of the mountain has been reopened, roads built and the camp rehabilitated. The company plans to drive another tunnel to intersect veins uncovered by surface work.

Purchase Utah Mines

The G. S. Ziegler and Co., New York, has announced the purchase of properties of the American Asphalt Assn. and the Castle Peak Gilsonite Co. in the Uintah Basin. The American Asphalt Assn. has mines at Little Bonanza, Uintah County, Utah. The Castle Peak Gilsonite Co., Provo, has land in the Bonanza area and a small pulverizing and packing plant at Provo. Last year the Ziegler firm bought the mines of the Utah Gilsonite Co. in the Uintah Basin. This latest purchase brings reserves to over 2,000,000 tons of natural asphalt. Certain improvements in mining, grading, handling and packaging of production are planned.

New Uranium Processing Plant

A contract has been signed between the Atomic Energy Commission and the Kerr-McGee Oil Industries, Inc., for the construction and operation by Kerr-McGee of a new $3,000,000 uranium processing plant at Shiprock, N. M. The announcement was made by Sheldon P. Wimpfen, manager of the commission's Grand Junction Operations Office.

The commission has operated a sampling plant at Shiprock for the past two years, and ores produced in the northern part of the Navajo Indian Reservation have been stockpiled at the sampling plant pending construction of a processing plant. The sampling plant has been operated for the commission by the American Smelting and Refining Co.

Construction and operation of the new plant will be undertaken by the Navajo Uranium Division of Kerr-McGee. Clyde Osborn, manager of operations, is in charge of mining and milling operations, and G. R. Kennedy is manager of exploration. The construction of the plant was expected to start in September and actual milling of the ore is scheduled to begin in 1954. With the completion of this plant the total number of plants on the Colorado Plateau will be increased to ten.

Bunker Hill's Safety Record

Bunker Hill and Sullivan Mining Co. mill employes worked 159,898 man hr during the year ending July 1 without a lost-time injury.

New Vanadium Deposit

Forrest V. Tindall, Lewiston, Mont., claims to have found a vanadium deposit in the nearby Judith Mountains which, on examination of samples sent in by Tindall, is reported to have contained about 10 percent vanadium.

Hoist Installed in Arizona

American Copper Co. has completed the installation of a large hoist and increased compressed-air supply at its copper-gold-silver mine south of Superior, Ariz. The new equipment will permit deepening the present 600-ft shaft to 900 ft, where it is expected that sulphides will be encountered. The mine is located in the Mineral Hill district and was acquired by American Copper from the Sunset Mining Co. and Arizona Mining Co. this year. P. H. Boether, president of American Copper, has reported that exploration will continue at a rapid pace.

Will Ventilate Lark Mechanically

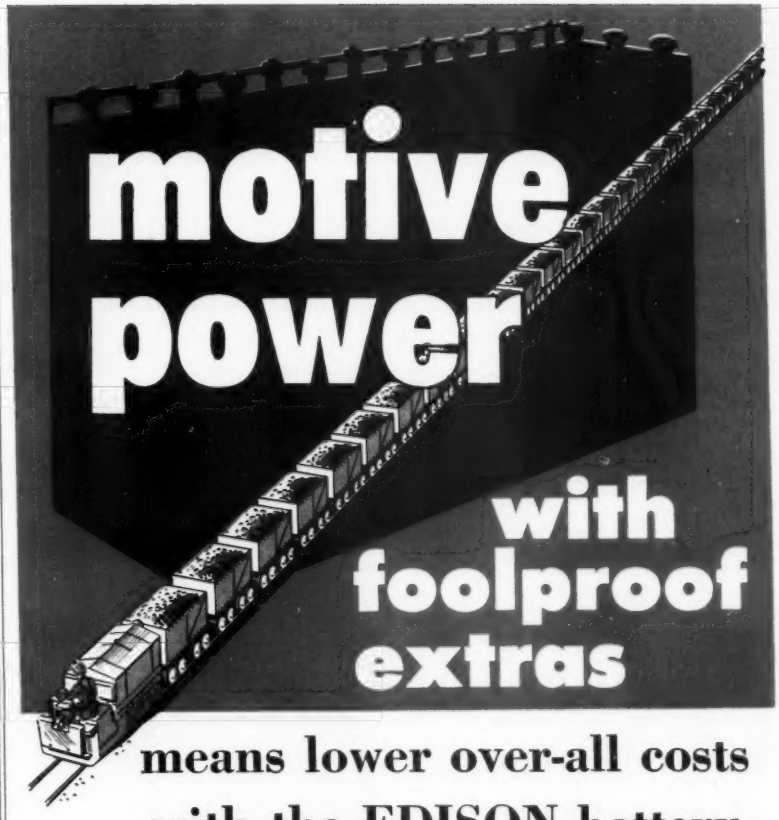
The old Dago tunnel and Yosemite No. 2 incline, located in an old section of the U. S. Smelting Refining and Mining Co.'s Lark Mine near Lark, Utah, are being widened and retimbered to completely revise the ventilation system for the Lark Section.

For many years air has been circulated through the mine primarily by natural ventilation. Then three years ago a fan was installed on top of an air raise connecting with the Mascotte tunnel to help circulate the air. The new system will ventilate the mine entirely by mechanical means.

Work has been in progress on the project since the fall of 1951. It now appears that the work will be completed and the new system will be operating early in 1954.

Yosemite No. 2 incline and the Dago tunnel, which connects the incline with the surface, will continue to be the 4100 air raise connecting the Mascotte tunnel with the No. 12 raise, Bingham Prospect incline in the Congor tunnel.

Up until now, work crews have driven a crosscut on the Mascotte tunnel level to the projected bottom of the Yosemite No. 2 incline and raised 600 ft from this point to extend the old incline down to the Mascotte tunnel level. Widening and retimbering the Dago tunnel has been done intermittently. In the past several months, crews have completed widening and supporting the ground of the Yosemite No. 2 incline down to the 500 level.



means lower over-all costs
with the EDISON battery

electrically foolproof

. . . Because they don't require critical regulation of charge rates, EDISON batteries can be charged directly from a mine's d-c power supply. They can be fully charged in 6 to 7 hours . . . require no equalizing . . . which helps get charging done during off-peak periods at lower cost.

mechanically rugged

. . . With steel cell construction and a solution which is a recognized preservative of steel, EDISONS are built to stand the rough abuse incidental to mining operations.

longer useful life

. . . Many users report 2 to 3 times longer life with EDISONS than with other type batteries. They are so dependable that they are frequently used for lighter duty service on telephone and alarm circuits or emergency lights after being retired from heavy haulage work.

For utmost dependability and lower ultimate cost it will pay you to standardize on EDISON batteries. Write for Bulletin S.B. 3826 and the address of your Edison field engineer. Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, New Jersey.

Most Dependable Power
—Lowest Over-all Cost
. . . you get both
with an EDISON

EDISON
Nickel · Iron · Alkaline
STORAGE BATTERIES

Advances Made in Battle for Manganese

INITIAL objectives have been won, the Interior Department's Bureau of Mines reported recently, in a top-priority campaign to develop methods for recovering strategic manganese from the West's large reserves of low-grade ore.

Processes were developed during two years of intensive research in laboratories at Salt Lake City, Utah, and Tucson, Ariz. They have been proved, in part, in the last 18 months of continuous pilot plant operations at Boulder City, Nev.

The metallurgical problems are difficult and much remains to be done, but significant advances now have been made, Regional Directors H. C. Miller of San Francisco and J. H. East, Jr., of Denver, announced jointly.

By Congressional authorization, flotation and hydrometallurgical pilot plants were built in Boulder City to develop further and prove the laboratory procedures devised at Salt Lake City, Utah, and Tucson, Ariz., for ores of the Artillery Peak (Ariz.) district. This deposit, 50 miles south of Kingman, Ariz., and one of this country's largest, has been estimated by the U. S. Geological Survey to contain a minimum of 175,000,000 tons of marginal and submarginal material. Of the total, some 15 to 20,000,000 tons is believed to contain five percent or more manganese and more than 2,000,000 tons is estimated to be 10 percent grade or better.

A mine was opened and operated briefly at Artillery Peak to explore and develop the ore body, and 3500 tons of ore were trucked to Boulder City for an investigation of low-cost extraction methods. The flotation pilot plant was operated from November 1951 until July 1952, treating 25 tpd of ore until the stockpile was exhausted. The hydrometallurgical plant was completed in May 1952 and has been processing the ore and products from the flotation plant continuously since that time, the Bureau spokesman stated.

Three alternate methods of treatment developed in the laboratory were tested in the pilot plants to determine which was better. In the first, ore containing about 11 percent manganese was finely ground and then separated by flotation to recover a concentrate assaying 35 percent manganese. Laboratory tests indicate that the nodulized or sintered concentrate can be smelted in an electric furnace to produce the standard ferromanganese required by the steel mills, although pilot plant experience shows that the problem of reducing silicon content will be difficult.

The other two procedures tested were more involved but ultimately may prove the better on some low-grade ores, Bureau metallurgists believe. In one of these processes the ore was concentrated by flotation to yield a concentrate and a middling product with an over-all recovery of 85 percent of the manganese, the same recovery attained by the first method. The middling product then was leached by the Bureau-developed dithionate process in which manganese is extracted with sulphur dioxide and recovered by precipitation with lime. Virtually all of the manganese is recovered as a plus 60 percent precipitate for blending with the flotation concentrate to obtain a product suitable for smelting to ferromanganese.

In the third method—a modification of the first two—a 60 percent manganese precipitate was recovered by dithionate leaching of a portion of the crude ore. This precipitate then was blended with flotation concentrates produced by the first process to yield a ferrograde manganese product.

Ore concentration studies are further advanced than either the leaching or smelting work, for a practical flotation process has been proved. Completion of the hydrometallurgical studies will permit estimates of the capital and operating costs for the alternate processes and will yield the necessary engineering data for design of commercial plants.

Dithionate leaching investigations on Artillery Peak ores and flotation middlings are well advanced. An excellent recovery of manganese in a high-grade product has been achieved. Although several operating problems remain to be solved, the process is considered sound and practical.

Small-scale batch electric smelting tests on nodulizing Artillery Peak concentrates have indicated the feasibility of producing ferromanganese directly from the concentrates, although silicon removal is an obstacle.

Despite the significant advances, however, unsolved problems remain in each field, Miller and East reported.

In ore concentration, better grinding, classification, and conditioning methods and a more effective reagent combination should be developed for commercial operation. Moreover, further work is needed on the lower-grade Artillery Peak ores containing 4 to 6 percent manganese, for these constitute the larger reserves of the district.

In leaching, several alternate methods need further laboratory study and testing in the pilot plant.

In smelting, larger-scale continuous tests are required to determine the recovery of ferromanganese that can be obtained from the sub-standard nodules, ascertain power requirements, evaluate slag and refractory problems, and obtain cost data.

The race isn't over, but we've cleared some of the major hurdles, the regional directors stated. Moreover, they are convinced that the processes being used in the pilot plants can be improved further and made applicable to other low-grade domestic manganese ores.

USBM Southwest Experiment Station Pilot Plant tested low grade manganese ores with encouraging results

Manufacturers Forum

G. M. Acquires Euclid

General Motors Corp. has acquired all of the outstanding stock of the Euclid Road Machinery Co., Cleveland, according to an announcement on October 1 by Harlow H. Curtice, G. M. president. The acquisition was pursuant to G. M.'s exchange offer of August 7, 1953, which was approved by Euclid shareholders on August 28.

Euclid Road Machinery Co. will be operated as a wholly-owned subsidiary. The present management will continue under the direction of Raymond Q. Armington, president and general manager.

Battery Cell Puller

Users of storage batteries will find the new cell puller developed by Gould-National Batteries, Inc., Trenton, N. J., useful in removing cells from batteries for examination or repair, according to the manufacturer. The tool, generally used in sets of two, consists of a U-shaped steel loop brazed to a hexagonal steel nut with specially cut threads tapering from bottom to top. The nuts are screwed down over the lead posts, a piece of wood is placed in the loops and the cell is pulled from the battery by a chain or rope. The same tool is also used with hold-down clips for removing the elements from the jar.

Change Drum Colors

Standard Oil Co. (Indiana) has adopted a simplified, uniform color scheme for its 55- and 33-gal drums—a bright blue it hopes the public will identify with its products.

By October 1, most Standard Oil drums will be a solid "Brite Copen Blue," a shade between sky blue and vivid blue. The move is in the interest of simplification. In the past there have been up to 30 different color combinations for drums—for instance, green for sprays, blue and gray for industrial oils, white and gray for anti-freeze, blue and red for one motor oil and gray and green for another. The exact name of the product has always been stenciled on the drum heads, anyway, and this will be continued.

Exceptions to the new light-blue color system will be: drums containing low flash-point products will continue to be red as required by state and other regulations. Those containing 2.4-D will be the new blue with a purple band. Resin-lined drums used for high-flash napthas and refined oils will be orange. Drums used for some black oils and asphalts will remain black.

Show New Drill

Mobile Drilling, Inc., has entered into the deep rotary field with its new model B-52 drill. The drill features 500-ft drilling depth, one man operation, skid or trailer mounting with independent power plant or P.T.O. operation. It is designed to fit Ford, International, Willys, Chevrolet or Dodge heavy duty trucks.

Executive offices of Mobile Drilling, Inc., are located at 960 North Pennsylvania St., Indianapolis, Ind.

MSA Handles New Dust-Measuring Instruments

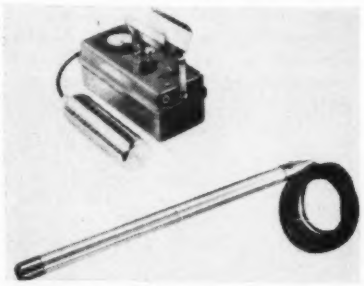
Mine Safety Appliances Co., Pittsburgh, has been named exclusive distributor in the United States for a line of dust-measuring instruments manufactured by C. F. Casella & Co. Ltd. of London, England.

The instruments now being introduced for American users include the MSA-Casella "Cascade Impactor," for discriminatory collection of air-borne dusts by particle size; "Settlement Dust Counter," for accurate collection of dust particles or air-borne bacteria; "Thermal Precipitator," for sampling a wide variety of smoke, fumes and dusts, organic or inorganic; and the "Jet Dust Counter," for rapid or "snap" dust sampling without interruption of operations.

Detailed information on the MSA-Casella instruments is available upon request to Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa.

Uranium Search Aids

The Radiac Co., Inc., 489 Fifth Ave., New York 17, N. Y., presents two new scintillation counters for uranium prospecting surveys. The "Fission Finder" Scintillation Survey Meter and the "Fission Tackle" Scintillation Drill Hole Probe-type Radioactivity Detector are self-contained battery operated scintillation counters for detecting and measuring radioactivity. These instruments are gamma sensitive, and the "Fission Finder" Survey Meter can be made to detect alpha and beta activity when used with the appropriate phosphors.



The "Fission Finder" Survey Meter can be used for any project calling for an ultra-sensitive portable radioactivity detector where the overburden may reduce surface radioactivity to a small fraction of the background. It can be used for prospecting on foot, and from a moving vehicle or low-flying airplane.

New Scraper Line

A new line of open-top, tractor-drawn, rubber-tired scrapers ranging in capacity from 10.5 to 28.5 cu yd is announced by LeTourneau-Westinghouse Co., Peoria, Ill.

These scrapers are designed to fit any tractor-scraper job and are available in four sizes. The O-14 Carryall Scrapers, which are designed for use with tractors of 70 hp or more, have a struck capacity of 8.1 cu yd and a

heaped capacity of 10.5 cu yd. The O-19 Carryall Scraper for use with 75 or more hp tractors has a struck capacity of 12.2 yd and heaped capacity of 16 yd. The third size of the open-top line, O-23 for use with 80 or more hp tractors, carries a struck capacity of 14.4 yd and a heaped capacity of 19 yd. The Model O-35 Carryall Scraper carries a load rating of 22.5 yd struck and 28.5 yd heaped and is designed for 100 or more hp tractors.

Conveyor "Dewaters" Taconite

A rubber conveyor belt made with a surface that sheds or retains water is now helping in the production of taconite.

The belt automatically dewaters finely ground taconite as it conveys the wet material from storage tanks for processing. A simple adjustment makes the belt retain water with equal ease. Called "Riffle Grip," the belt is made by the B. F. Goodrich Co. Industrial Products Division.

According to Clyde O. DeLong, president of the Industrial Products

Division, secret of the belt's dual performance lies in its unique cover design. Molded rubber ridges which stand ⅛ in. high are formed in a continuous series of chevron patterns spaced several inches apart.

Operating on a predetermined conveyor incline angle, with belt idlers also placed at a specified angle, the chevron-like ridges channel water to the belt edge.

Adjustment of the conveyor incline angle and the angle of belt idlers changes the chevron-patterned surface into a series of horizontal carrying ribs which retain water on the belt and permit even distribution of moisture throughout the material.

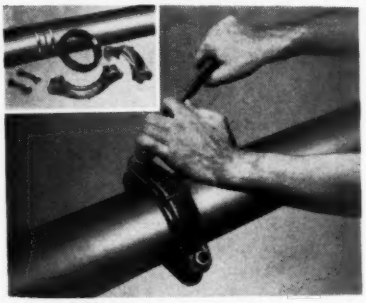
Eye Protection

A new goggle for wear over prescription glasses is announced by Willson Products, Inc., Reading, Pa. Known as the Kover-Mor style, the new goggle provides a comfortable fit with ample clearance over modern, large-frame prescription glasses. Two versions are offered—a chipping style, with clear, heat-treated glass lenses; and a welding goggle, with choice of filter lens shades.

Couplings for Grooved Pipe

The "Gruvajoint" is a new lightweight coupling for grooved pipe systems designed and produced by Gustin-Bacon Manufacturing Co., Kansas City, Mo.

Gruvajoints are specifically designed



for coupling grooved pipe systems where pressures do not exceed 500 psi. Manufacturer says that the new couplings automatically absorb expansion and contraction, shock, ground motion and vibration. They remain leakproof under end pulls up to 7500 lb; permit layout misalignment up to 3°; withstand temperatures between 200° F and minus 65° F. Complete information may be obtained from Gustin-Bacon Manufacturing Co., 210 West Tenth Street, Kansas City, Mo.

Match Dual Tires

A handy new dual tire matching caliper, designed to help give more efficient fleet operation and lower cost per mile for truckers, has just been announced by United States Rubber Co.

This tool may be used to insure proper matching when installing new tires or when rotating tires. Also, where a trucker stocks recapped or repaired tires, he can identify them by measurement for ready reference when matching them with the tires on his trucks.

Heavy Duty Scalping Screen

Link-Belt Co. has announced a new heavy duty scalping screen for fast economical scalping of ore, rock and similar materials.

These screens have massive decks formed with a combination of wide flanged "H" beams and deep section ship channels, stress relieved for maximum strength and freedom from distortion. The rugged deck is designed to handle the high impact of large boulders.

A full floating vibrator mechanism, completely enclosed for operation under severe dust conditions, permits the screening of extremely high capacity of sticky ore with maximum efficiency according to the manufacturers. Screen movement is easily adjusted by varying the amount of segmental weights.

Maintenance is simplified by making the bearings readily accessible. Hydraulic bearing removal further decreases maintenance time. Deck can be furnished either with grizzly or heavy perforated plates with riding bars.

Link-Belt Folder No. 2461, with photographs and schematic drawings, provides detailed information. It will be sent to interested readers on request.

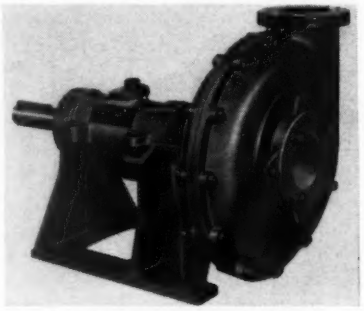
Large Dump Body

The "Morgantown," a new 20-ton capacity tandem axle straight bed dump body is announced by The Galion Allsteel Body Co., Galion, Ohio.

The body is constructed of 10-gauge steel with a full size cab protector. Over-all body length is 20 ft. It is 84 in. wide at the floor level and 95½ in. wide at the point where side boards are inserted. Dumping is handled by a Galion Model 77353 hoist. This consists of two 7-in. twin ram 3-stage twin telescopic cylinders. Rated hoist capacity is 20 tons.

New Pump Offered

For pumping abrasive or corrosive solutions that must be delivered undiluted, the Allen-Sherman-Hoff Pump Co., Wynnewood, Pa., offers a Centriseal Pump designed to operate entirely without sealing water. Besides meeting this pulp restriction in mining and



chemical fields, the Centriseal is the A-S-H substitue for the Hydroseal Pump wherever sealing water is unavailable. Like the Hydroseal, its pumping parts are protected by moulded Maximix rubber. For pumping acids, the stuffing box, packing gland and shaft sleeve are tailor-made of properly resistant alloys. The mechanical parts of the Centriseal are interchangeable with those of the anti-friction-bearing type of Hydroseal Pumps.

Announce New Compressor

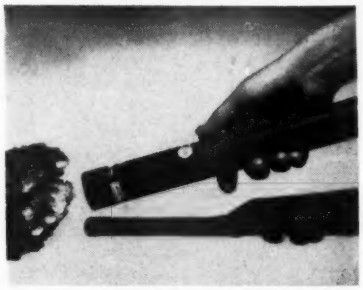
A new 210-cfm compressor of high speed 2-wheel trailer design is announced by Davey Compressor Co., Kent, Ohio.

Known as Super Chief Model 210-WDS, the new unit is of W series design and is equipped with newly-developed Davey Multi-Port Valves. Use

of these valves is said to increase by 15 to 25 percent the amount of air delivered per lb of fuel. In addition, valves are reputed never to carbon or foul and to operate at peak efficiency during the life of the compressor.

Ultraviolet Detection

Menlo Research Laboratory has developed a compact new *Blacklight Wand* model for addition to its series of "Fluoretor" portable ultraviolet in-



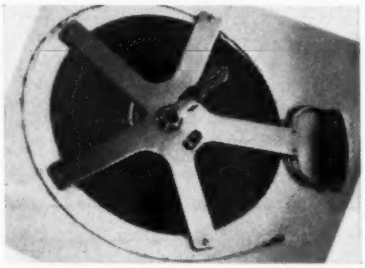
struments. Field tests indicate the new Wand will broaden use of ultraviolet detection and comparison in a wide range of scientific and commercial activities.

Miniaturization of the electronic components has enabled reduction of total weight—including two standard flashlight batteries—to only 1¾ lb.

Specifications and descriptive literature are available from Menlo Research Laboratory, Post Office Box 522, Menlo Park, Calif.

Improve Mine Tapes

The Lufkin Rule Co., Saginaw, Mich., has announced its new "Lucas" mine tapes. The tapes have an improved 5-arm reel, designed specifically to accommodate long narrow tapes.



Graduations and figures on the tape are deeply stamped into nickel-silver sleeves that are securely soldered to the line. Sleeves are slip-proof and moisture-proof.

Heavy gauge nickel-plated steel is used in the reel and the five metal arms each have a tape roller for smoother action. The reel is fitted with a long winding handle and a large drum for rapid reeling.

A free illustrator folder containing specifications and prices will be supplied by The Lufkin Rule Co. upon request.

Announce New Crusher

A new portable crushing and screening plant, the "All American 77," is announced by Diamond Iron Works.

According to the manufacturer, the new plant was designed to meet two primary demands: (1) The greatest possible production of uniform aggregate (in an uninterrupted flow) at the lowest possible cost per ton; (2) complete maneuverability on the road and in the pit, keeping in mind the highway traveling restrictions.

For complete information contact Diamond Iron Works, Inc., 1748 N. Second St., Minneapolis 11, Minn.

Improved Blasting Method

A new blasting method which uses charges of low and of high velocity explosive in alternate holes, in conjunction with millisecond delay detonators, is available to quarry, open pit and strip mine operators.

Tested in the quarry field, the new method reportedly has often resulted in more breakage per pound of explosive, together with better control of throw. The new system is termed "alternate velocity loading" by the Atlas Powder Co., which developed it.

In practice, the rock is placed under a powerful twisting stress by the initial discharge of a low velocity explosive. High velocity explosive, detonated a small fraction of a second later, hits the fully stressed rock at the moment when maximum shattering action can be obtained. As in the past, millisecond delay detonators are used with the two types of charge, and contribute to the total performance.

Economy is maintained by the use of low-cost ammonium nitrate explosive which is made to perform as low, medium or high velocity explosive by the insertion during manufacture of a core of ammonia gelatin.

Technical information on the application of this new development is available from the Technical Division, Explosives Department, Atlas Powder Co., Wilmington 99, Del.

—ANNOUNCEMENTS—

Gordon W. Rowand has been appointed assistant sales manager of **Link-Belt Speeder Corp.**, manufacturers of power cranes, shovels and draglines, with headquarters at Cedar Rapids, Iowa.

Walter H. Douglas of Detroit has been appointed to represent **Cone-Drive Gears**, Division of Michigan Tool Co. of Detroit, in northern New Jersey, northeastern Pennsylvania, downstate New York and the New York city area.

The appointment of **Clarence E. Killebrew** as manager for marketing and sales of the Construction Machinery Division of **Clark Equipment Co.**, manufacturers of materials-handling equipment, was announced by George Spatta, president.

Jack Ammann Photogrammetric Engineers have expanded a number of times in 22 years. To meet today's growing needs for their services, they have just moved into a new three-story-and-basement building containing over 50,000 sq ft of working space in San Antonio, Texas.

Now in use in the new Ammann plant is what is recognized as the most precise plotting instrument in the world, the Wild A-7 Autograph, the latest development of Henry Wild Co. of Switzerland. The organization also operates a battery of Kelsh Plotters, the latest American development in the field of photogrammetry.

Branch offices of Jack Ammann Photogrammetric Engineers are located in Manhasset, N. Y., and in Denver, Colo.

The **Roger Pierce Equipment Sales Co.** has changed its name to the **Machinery Center, Inc.** All officers and assets remain unchanged as does the mailing address—808 Newhouse Bldg., Salt Lake City 1.

John S. Carr has been appointed manager of pump sales for American Manganese Steel Division of **American Brake Shoe Co.** He will be located at the Amsco plant in Chicago Heights, Ill.

Eugene Larson has been appointed sales manager for **E. J. Longyear Co.** Larson is experienced in the industrial machinery field, and will head all sales and promotion activities.

In line with its planned expansion and diversification program **Mosebach Electric & Supply Co.**, Pittsburgh, has taken over **Allegheny Warehouse Corp.**, of McKees Rocks, Pa., according to an announcement by Ray Hampton, Mosebach president.

At the same time, he announced the following Mosebach appointments and promotions: **Ralph M. Nadler**, executive vice-president; **Harold J. Evans**, vice-president in charge of operations; **George F. Baney**, assistant vice-president in charge of purchasing and customer relations; **Edwin L. Core**, assistant vice-president and general manager.

Richard Wright was named president of **Penn Machine Co.** at a recent meeting of its board of directors. Previously he had been associated with Westinghouse Electric Corp. for 16 years.

Index to Advertisers

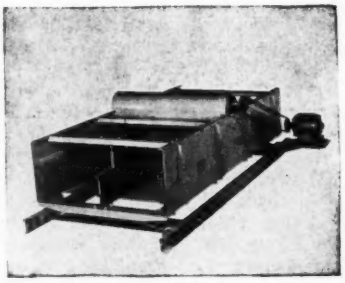
	Page
Allis-Chalmers Mfg. Co. Tractor Division	22-23
American Brake Shoe Co. (American Manganese Steel Division)	46
American Car & Foundry Co.	12
American Cyanamid Co. (Explosives Department)	41
American Mine Door Co.	74
Ammann Photogrammetric Engineers, Jack	78
Anaconda Wire & Cable Co.	61
Armstrong-Bray & Co.	70
Atlas Powder Co.	25
Bethlehem Steel Co.	58
Bituminous Coal Institute	53
Bowdil Co.	47
Bucyrus-Erie Co.	16-17
Card Iron Works Co., C. S.	75
Colorado Fuel & Iron Corp.	65
Crucible Steel Co. of America	7
Cummins Engine Co., Inc.	44-45
Deister Concentrator Co., The	73
Eagle-Picher Co.	29
Edison, Inc., Thomas A. Storage Battery Division	79
Euclid Road Machinery Co.	20
Farmers Engineering & Mfg. Co.	77
Gardner-Denver Co.	48
Goodman Mfg. Co.	15
Hewitt-Robins Incorporated	26-27
Hoffman Brothers Drilling Co.	70
Holmes & Brothers Inc., Robert	6
Indiana Foundry Co.	72
Ingersall-Rand Co.	14
Jeffrey Mfg. Co.	8-9
Jet-Lube, Inc.	76
Joy Mfg. Co.	42-43
Kennametal, Inc.	40
Le Roi Co.	10-11
Link-Belt Co.	Second Cover
Link-Belt Speeder Corp.	28
Loftus Corp., Peter F.	67
Macwhyte Company	74
Mine Safety Appliances Co.	Back Cover
Mott Core Drilling Co.	84
Naylor Pipe Co.	76
Ohio Brass Co.	13
Pattin Mfg. Co.	72
Pennsylvania Drilling Co.	84
Read, Davis	67
Roberts & Schaefer Co.	30
Roebling's Sons Co., John A.	4
Salem Tool Co.	71
Sheffield Steel Corp.	62
Sprague & Henwood, Inc.	21
Standard Oil Co. (Indiana)	19
Syntron Co.	68-69-71
Thor Power Tool Co.	18
Timken Roller Bearing Co.	24
United States Rubber Co.	1 and Third Cover
Universal Vibrating Screen Co.	84
Westinghouse Electric Corp.	2-3
Woomer & Associates, J. W.	67
Young, L. E.	67

CORE DRILLING
ANYWHERE
We look into the earth
PENNSYLVANIA DRILLING COMPANY
PITTSBURGH 20, PA.

CORE DRILLING
CONTRACTORS
Testing Coal Properties a Specialty
Guaranteeing Satisfactory Coal Cores
Pre-grouting mine shafts
Large diameter holes for Drainage, Air-shafts and Escapeways
Inside Mine Drilling
MOTT
CORE DRILLING CO.
Huntington, W. Va.

For fast, economical screening there is nothing finer than the dependable type "MR" 42" x 96" 2-deck model.

WRITE FOR BULLETIN No. 125 TODAY.

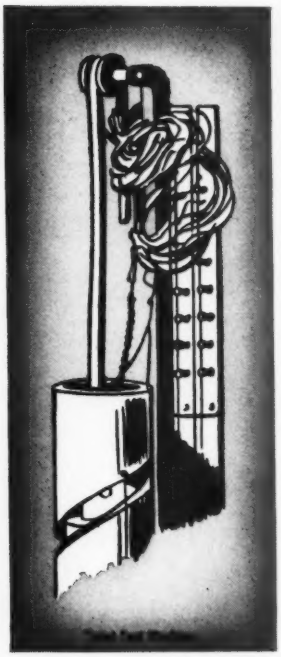


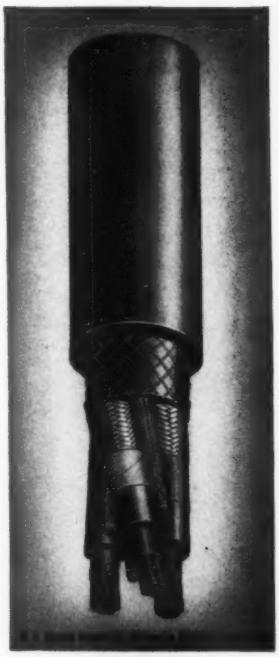
UNIVERSAL VIBRATING SCREEN CO.
RACINE, WIS.

U. S. Royal Cables are
Tough!

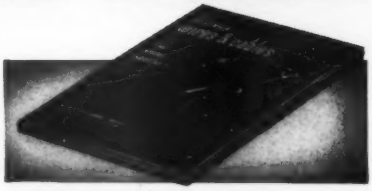
● U. S. Royal Cords and Cables must undergo half a dozen tough tests—to make sure they can stand up under the rigorous demands of modern mining. That is why a U. S. Royal Cable is *always reliable.*

United States Rubber Company is the only wire and cable producer to grow its own natural rubber, to make its own synthetic rubber and its own plastics. "U. S." controls the quality of its product at every step of its growth and manufacture.





Trailing Cables are often subjected to severe twisting in operation. To make sure that U. S. Royal Cables can take it, they are subjected to a combined twist-bend test. In this test a 42-inch length of cable is twisted radially 90 degrees in one direction, untwisted and twisted 90 degrees in the opposite direction. While being subjected to this 180-degree twist test and while supporting a 50-lb. weight, the cable is repeatedly bent over a sheave having a diameter approximately 3 times the diameter of the cable. Most U. S. Royal Cords and Cables are required to withstand 3,000 of the above twist-bend cycles before failure.



● Write to address below for free booklet, "U. S. Electrical Wires and Cables," which describes the complete line for the mining industry.

UNITED STATES RUBBER COMPANY

U.S.RUBBER
SERVING THROUGH SCIENCE

Electrical Wire and Cable Department

ROCKEFELLER CENTER • NEW YORK 20, NEW YORK

For any Lamp Handling System

. . . the EDISON R-4 ELECTRIC CAP LAMP

In Edison equipped mines across the nation you'll find Self-Service, Modified Self-Service and Standard Service installations. These different systems, established to satisfy individual needs, provide convincing testimony that the Edison R-4 is the answer to any lamproom requirement.

SELF-SERVICE SYSTEM

MODIFIED SELF-SERVICE SYSTEM

STANDARD SERVICE SYSTEM

M.S.A. Charging Rack and Charging Control Equipment give you a compact, efficient installation. This equipment provides a central point of control for the charging cycle.

The Best Lamp Handling System is the One Best Suited to Your Needs

Because no *one* lamp handling system works best for *every* m program, it is essential to design a method that fits into *your* partic operation.

Regardless of the system you choose, the Edison R-4 can m your requirements. Making good on this assignment naturally c for something extra in lamp quality and dependability. The Edi R-4 has every modern improvement that continuing research, cra manship and manufacture can provide. The same design and c struction QUALITIES that give the Edison R-4 its brilliant, *unfai* light underground are setting a standard for lamproom performa everywhere.

MINE SAFETY APPLIANCES COMPAN

201 North Braddock Avenue, Pittsburgh 8, Pa.

At Your Service: 77 Branch Offices in the United States and Mexico

MINE SAFETY APPLIANCES CO. OF CANADA, LIMI

Toronto, Montreal, Calgary, Edmonton, Winnipeg, Vancouver, New Glasgow,

MSA

SAFETY EQUIPMENT HEADQUARTERS

When you have a safety problem, M.S.A. is at your service . . . Our job is to help you